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TRADE MARK REG. U. S. PAT. OFF.

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243-249 W. 39TH ST.
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THE INIMITABLE
BEARING

See Pages
87 to 98
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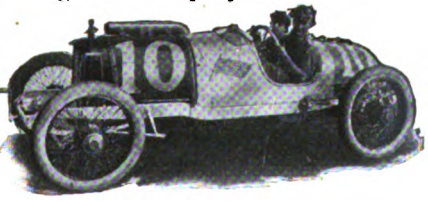

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SHELDON

ABOVE all else Sheldon means quality.

Sheldon products are never bought because of price, because in about 99% of the cases Sheldon products individually cost more to the manufacturer initially.

The fact that price is the last consideration in the sales of Sheldon products is in large measure responsible for the unsurpassed quality of these products.

One thought, and one only, dominates both design and manufacture of every Sheldon part—that of ultimate efficiency in the hands of the consumer.

In the following pages will be found important facts and figures concerning Sheldon front and rear axles and springs.

THE SHELDON AXLE & SPRING COMPANY

Makers of Springs and Axles for Heavy Duty Service for More Than 50 Years

WILKES-BARRE, PA.

CHICAGO: 122 S. Michigan Blvd. SAN FRANCISCO: 444 Market Street

DETROIT: 1215 Woodward Avenue

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Six Sizes of Worm Gear Rear Axles for

Model	Capacity of Truck	Track	Spring Center	Springs
W-1000	1000 lbs.	56"	36½" 36½" 39"	2" 2¼" 2½"
W-1500	1500 lbs.	57"	39"	2½"
W-10 (Narrow Track) (Wide Track)	1-ton	58⅝" 61⅛"	36" 37½" 40½" 40"	2½" 3" 2½" 3"
*W-20 (Narrow Track) (Wide Track)	2-ton	59½" 62"	38" 40" 40½"	3" 3" 2½"
W-21 (Narrow Track) (Wide Track)	2-ton	58" 60"	39" 40"	3" 3"
W-30	3-ton	66"	42" 41½"	3½" 4"
W-50	5-ton	74½"	49" 46¾"	4" 5"

*(To be replaced by W-21.)

In all six sizes of Sheldon worm gear axles the worm loads, both radial and thrust, are carried by ball bearings.

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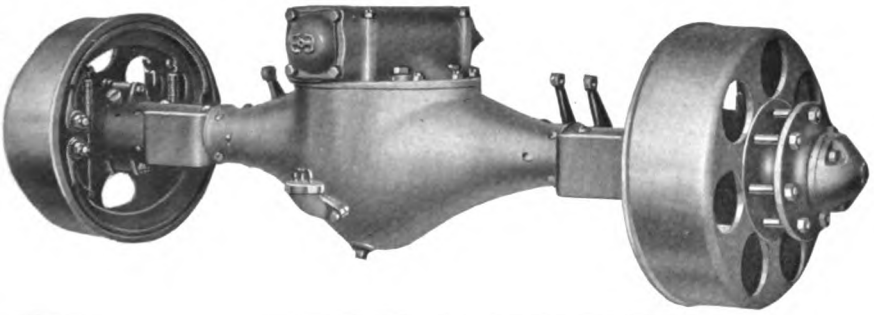

Trucks from 1000 Pounds to 5 Tons Capacity

Clip Hole	Ratio	H. P. Allowable	Brakes	Wheel Bearing
17/32" 17/32" 17/32" 17/32"	6.2 to 1	15 at 1000 R.P.M.	1¾"x14"	#310
25/32"	6.5 to 1	25 at 1000 R.P.M.	2½"x16"	#311
25/32" 25/32" 25/32" 25/32"	6.5 to 1 7.7 to 1 8.6 to 1	37 at 1000 R.P.M. 30 at 1000 R.P.M. 25 at 1000 R.P.M.	3" x16"	#312
25/32" 25/32" 25/32"	6.5 to 1 7.7 to 1 8.6 to 1	40 at 1000 R.P.M. 33 at 1000 R.P.M. 30 at 1000 R.P.M.	3" x16"	#314
29/32" 29/32"	8.6 to 1 7.7 to 1	35 at 1000 R.P.M. 40 at 1000 R.P.M.	2½"x18"	#314
1 1/16" 1 1/16"	8.7 to 1 11.7 to 1 13 to 1	52 at 1000 R.P.M. 39 at 1000 R.P.M. 36 at 1000 R.P.M.	2½"x20"	#317
1 5/32" 1 5/32"	8.7 to 1 11.7 to 1 13 to 1	60 at 1000 R.P.M. 45 at 1000 R.P.M. 40 at 1000 R.P.M.	3" x24"	#319

Semi-floating construction is followed in Sheldon worm drive axles, assuring maximum strength and durability with minimum weight and simplicity.

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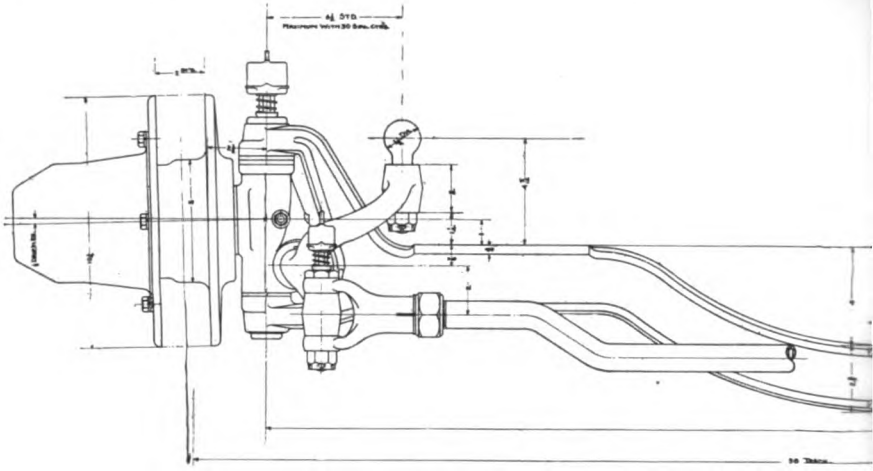

Front Axles—

Model	Capacity	Track	Spokes Size	No. Spokes	Spoke Bolt Holes in Hub Flange
D-260....	1588	56	1⅜	14	7
33-FA-500.	2160	56	1¾	14	7
2-FA-500..	2290	56	1¾	14	7
2-FA-10...	2850	56	2	14	7
D-343....	2850	56	2	14	7
3-FA-10...	3870	58	2	14	7
30-FA-10..	3870	58	2	14	7
30-FA-20..	4840	60	2½	14	7
4-FA-20...	5290	62	2½	14	7
4-FA-30...	6400	62	3	14	7
5-FA-30...	7040	68	3	14	7

Sheldon Front Axles have drop forged I-Beam beds of high-grade carbon steel. The opening between the yoke ends of the axle bed are extra large, which reduces the pressure on the pivot bolts and adds to the easy steering qualities of the axle.

Easy steering is a feature of Sheldon Axles and is accomplished by means of a ball bearing thrust bearing between the top of the steering knuckle and the axle yoke.

All knuckles and steering levers are of alloy steel.

The steering knuckles are securely anchored to the pivot bolt by a cap screw

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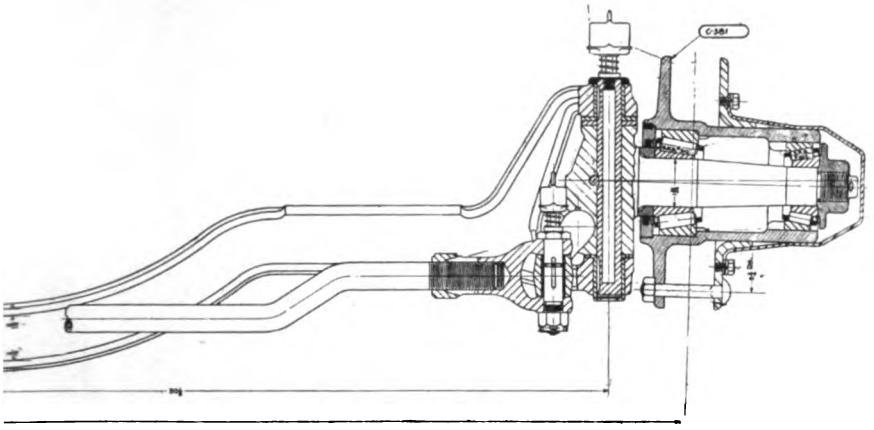

Dimensions

Spring Center	Width Springs	Bed Size	Spindle Size	Inner Bearing	Outer Bearing
27½	2	1⅝x2 3/16	1⅜	307	305
30	2	1¾x2⅝	1 9/16	308	307
30	2¼	1½x2½	1 9/16	308	307
30	2¼	1½x2½	1 31/32	310	309
29	2¼	1¾x2¾	1 31/32	310	308
33½	2½	1⅞x3	1 31/32	310	309
30	2½	2 x3	1 31/32	310	309
33½	2½	2 x3	2⅜	312	311
36½	3	2¼x3⅜	2⅜	312	311
36½	3½	2¼x3⅜	2 15/16	315	314
39	3½	2⅝x4	2 15/16	315	314

passing through the steering knuckle and pivot bolt, thus causing the pivot bolt to revolve in the hardened and ground bushings in the axle bed yokes.

Pivot bolts and clevis pins are hardened and ground, and operate in hardened and ground steel bushings in the axle yokes and clevises.

The spindles and hubs are machined for the double row series of annular bearings, permitting the use of all standard bearings of this series whether ball, straight or taper roller.

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Preliminary Recommendation of

Capacity of Truck, Net Tons	FRONT		
	Width	Length	
½	2	36	
¾	2¼	38	
1	2¼	40	
1½	2½	42	
2	2½	44	
2½	3	45	
3	3	46	
3½	3	47	
4	3	48	
5	3½	50	

These recommendations are intended on
on each spring is definitely known, con

Consult us for data concerning all

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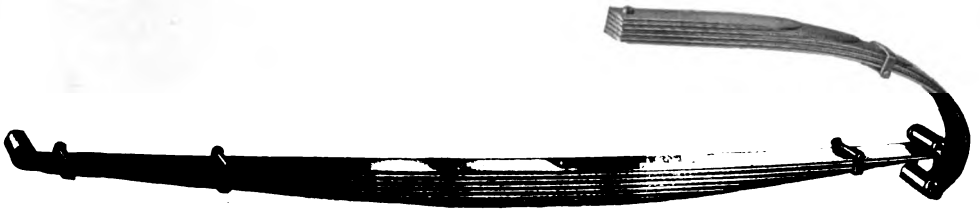

Length and Width of Truck Springs

REAR

When not Driving Through Springs		When Driving Through Springs	
Width	Length	Width	Length
2¼	46	2¼	50
2½	47	2½	52
2½	48	2½	54
3	49	3	55
3	50	3	56
3½	51	3½	58
3½	52	3½	60
3½	53	4	61
4	54	4	62
4	56	5	62

ly for preliminary layouts. When the load
sult us for the best length and width

types of springs for pleasure cars.

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Preliminary Recommendation of

Capacity of Truck, Net Tons	FRONT	
	Width	Length
½	2	36
¾	2¼	38
1	2¼	40
1½	2½	42
2	2½	44
2½	3	45
3	3	46
3½	3	47
4	3	48
5	3½	50

These recommendations are intended on
on each spring is definitely known, con

Consult us for data concerning all

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Length and Width of Truck Springs

REAR

When not Driving Through Springs		When Driving Through Springs	
idth	Length	Width	Length
2¼	46	2¼	50
2½	47	2½	52
2½	48	2½	54
3	49	3	55
3	50	3	56
3½	51	3½	58
3½	52	3½	60
3½	53	4	61
4	54	4	62
4	56	5	62

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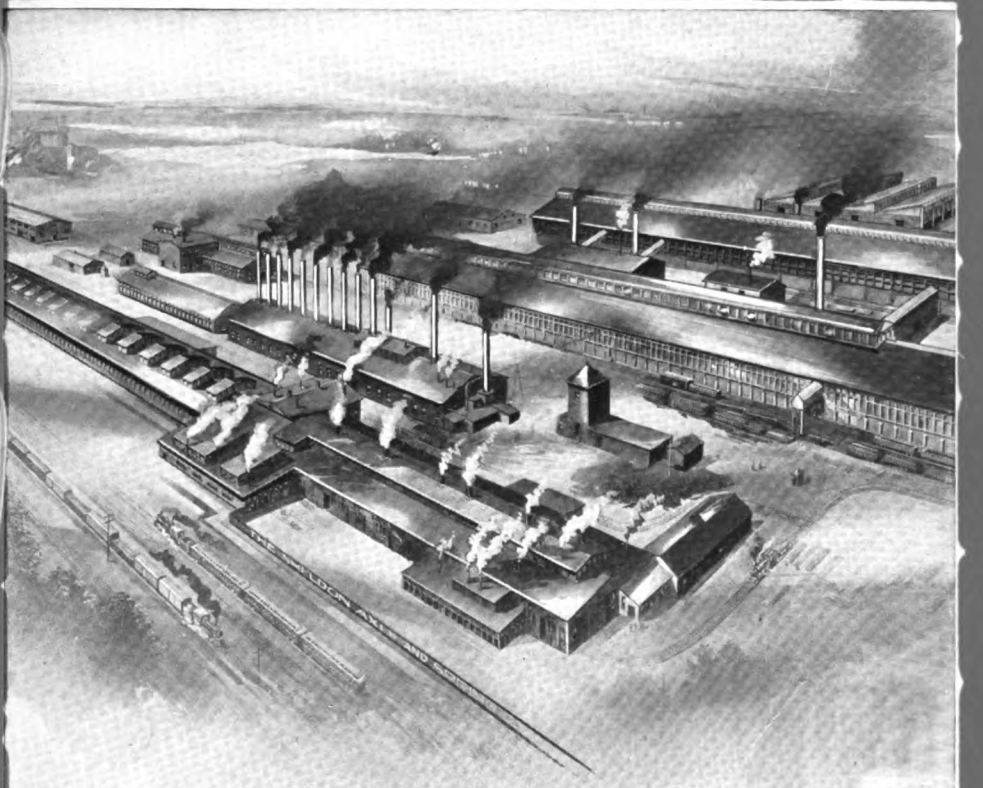

Front Axles
Worm Driven Rear Axles
Springs for pleasure cars
Springs for trucks

Each product designed solely to give greatest service at least cost to the ultimate consumer, irrespective of cost or other conditions.

Sheldon quality, in consequence, generally means an actual saving of money to the manufacturer.

THE SHELDON AXLE & SPRING COMPANY

Makers of Springs and Axles for Heavy Duty Service for More Than 50 Years

WILKES-BARRE, PA.

CHICAGO: 122 S. Michigan Blvd. SAN FRANCISCO: 444 Market Street DETROIT: 1215 Woodward Avenue

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Complete Vehicles

PART I

Classified Lists of the Manufacturers of Automobiles and Commercial Vehicles

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Complete Vehicles

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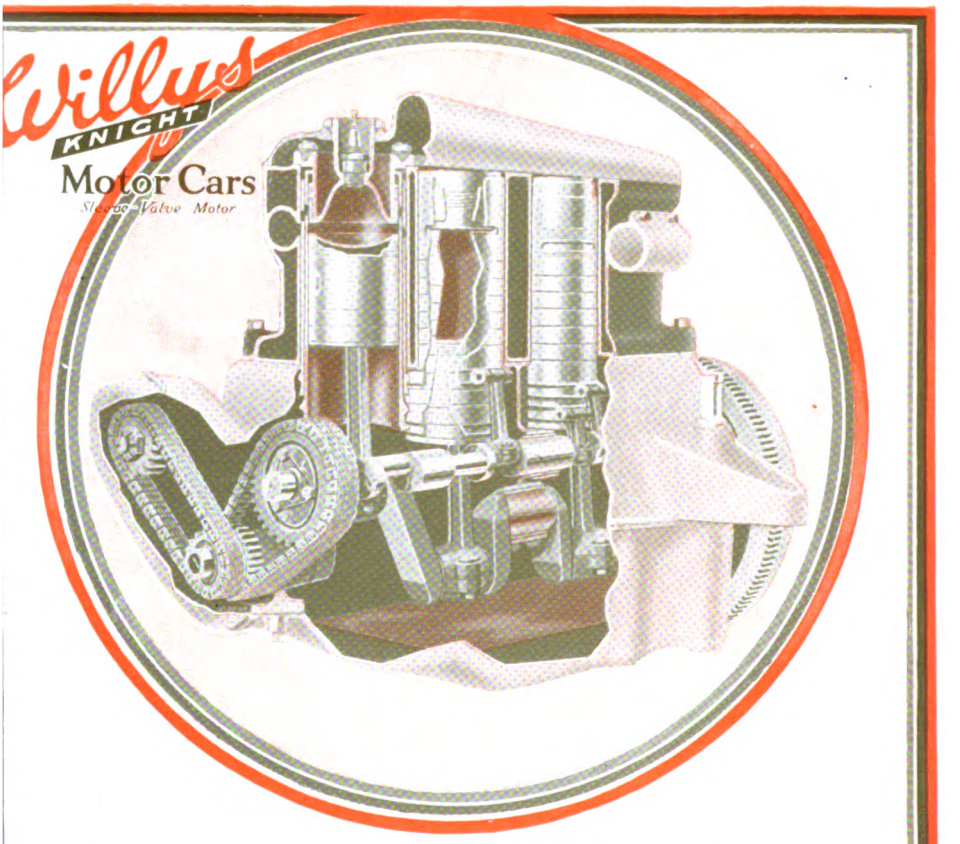

—its advantages are so well worth while

Here's what our experience with sleeve-valve motors on a big production scale has brought home to us.

At first it is the power and flexibility of these motors which win admiration.

For it is a fact that, size for size, cylinder for cylinder, the sleeve-valve motor delivers more power and has greater range on direct drive than any other type of motor.

That's one big positive sleeve-valve advantage.

Next comes its improvement with use.

Men who have owned cars with the usual motor equipment have grown accustomed to the ills which come with age in ordinary motors.

They expect a certain perfection of performance in a new motor, but they expect to lay it up every once in a while to have the carbon cleaned out and the valves ground and reseated.

Once a season they expect to give it up for overhauling and finally when no amount of doctoring will keep it quiet and bring back its power and pep, they expect to trade it in, take their depreciation, and get a new car.

So when a motor car veteran finds his sleeve-valve motor running quieter and with even greater power and pep as his mileage piles up his admiration is unbounded.

And that's another and a very great sleeve-valve advantage.

But the biggest advantage of all is durability.

Long after the time an ordinary motor would be completely worn out, you will find your sleeve-valve motor better than ever and you will hate to part with it.

So if you take delight in that common habit of a new car every year, perhaps you had better turn a deaf ear to sleeve-valve motor advantages.

But if you agree with us that greater power and flexibility, improvement with use, continuous, uninterrupted service and a great deal longer life are worth-while advantages—

Then remember that our huge production enables us to price sleeve-valve motored cars at hundreds of dollars less than they have ever before been priced, see the Overland dealer, and get a Wil'ys-Knight.

The Willys-Overland Company, Toledo, Ohio

"Made in U. S. A."

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Part I

COMPLETE VEHICLES

PLEASURE VEHICLES

GASOLINE VEHICLES

ABBOTT-DETROIT—See Consolidated Car Co.

ALL-STEEL Motor Car Co., Macon, Mo.

ALLEN Motor Co., North & Wood Sts., Fostoria, O.

ALTER Motor Car Co., Farmer St. & P. M. R. R., Plymouth, Mich.

ANDERSON Motor Co., Rock Hill, S. Car.

ANGER Engineering Co., 299-303 16th St., Milwaukee, Wis.

APPERSON Bros. Automobile Co., S. Main St., Kokomo, Ind. "Jack Rabbit."

APPLE Motor Car Co., W. A., 343 Cincinnati St., Dayton, O.

ARBENZ Car Co., Chillicothe, O.

ARGO Motor Co., 132 Park Ave., Jackson, Mich.
(See page 377.)

AUBURN Automobile Co., S. Main St., Auburn, Ind.

AUSTIN Automobile Co., 83-104 S. Division St., Grand Rapids, Mich.

BARLEY Mfg. Co., Streator, Ill. "Halladay."
(See page 221.)

BARTHOLOMEW Co. (Prospect Heights), Peoria, Ill. "Glide."

BELL Motor Car Co., York, Pa.
(See page 221.)

BEN Hur Motor Co., Rockefeller Bldg., Cleveland, O.

BIDDLE Motor Car Co., Germantown & Allegheny Aves., Philadelphia, Pa.

BIMEL Automobile Co., Sidney, O. "Elco."
(See page 59.)

BOUR-DAVIS Motor Car Co., Detroit, Mich.

BRISCOE Motor Corp., Jackson, Mich.
(See page 371.)

BUCKEYE Mfg. Co., 1801-09 Columbus Ave., Anderson, Ind. "Lambert."

BUICK Motor Co., Hamilton Ave., Flint, Mich.

BURNS Bros., Green St., Havre de Grace, Md.

C. A. C.—See Coey Motor Co.

CADILLAC Motor Car Co., 1342 Cass Ave., Detroit, Mich.

CAMERON Mfg. Co., West Haven, Conn.

CASE, T. M., Co., J. I., State St., Racine, Wis.

CHADWICK Engineering Works, Keim St., Pottstown, Pa.

CHALMERS Motor Co., Detroit, Mich.
(See page 51.)

CHANDLER Motor Car Co., Cleveland, O.
(See page 377.)

CHEVROLET Motor Co., W. Kearsley St., Flint, Mich.

CHEVROLET Motor Co. of N. Y., 818 11th Ave., New York, N. Y.

CINCINNATI Motors Mfg. Co., 1743-45 Central Ave., Cincinnati, O.

CLEBURNE Motor Car Mfg. Co., Cleburne, Texas.

COEY Motor Co., 2010-12 S. Wabash Ave., Chicago, Ill. "C. A. C."

COLE Motor Car Co., Indianapolis, Ind.
(See page 355.)

COLUMBIA Motor Car Co., Detroit, Mich.

COMMONWEALTH Motors Co., 326 W. Madison St., Chicago, Ill. "Partin-Palmer."

CONSOLIDATED Car Co., 960 Lafayette Ave., E., Detroit, Mich. "Abbott-Detroit."

CORTLAND Cart & Carriage Co., Motor Dept., Sidney, N. Y. "Hatfield."
(See pages 298 and 299.)

CRAWFORD Automobile Co., Surrey & Summit Aves., Hagerstown, Md.

CROW Motor Car Co., Main & Simonton Sts., Elkhart, Ind.

CROWTHER Motor Co., Ridgway & Woodson Aves., Rochester, N. Y.

CUMMINS-MONITOR Co., 402 Mt. Vernon Ave., Columbus, O.
(See page 561.)

CUNNINGHAM, Son & Co., James, 18 Canal St., Rochester, N. Y.

CYCLE-CAR Co. of Wilmington, 224 French St., Wilmington, Del. "Diamond."

DANIELS Motor Car Co., Third St. & Lebanon Valley R. R., Reading, Pa.

DAVIS Car Co., 2257-59 First Ave., S., Seattle, Wash.

DAVIS Motor Car Co., Geo. W., 11th & E. Sts., Richmond, Ind.

DE KALB Automobile Co., 2615 De Kalb St., St. Louis, Mo.

DE KALB Mfg. Co., Auburn, Ind.

DETROITER Motor Car Co., Vermont & Stanley Aves., Detroit, Mich.

DIAMOND—See Cycle-Car Co. of Wilmington.

DILE Motor Co., 721 N. Eighth St., Reading, Pa.

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PLEASURE VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

DISPATCH Motor Car Co., 14th Ave., S. E., & Winter St., Minneapolis, Minn.

DIXIE Mfg. Co., 12 S. Third St., Vincennes, Ind.

DIXIE Motor Car Co., Louisville, Ky.

DODGE Bros., 1678-1724 Jos. Campau Ave., Detroit, Mich.

DORRIS Motor Car Co., 4112 Laclede Ave., St. Louis, Mo.

DORT Motor Car Co., 316 South St., Flint, Mich.

DRUMMOND Motor Co., 2568-72 Farman St., Omaha, Neb.

EAGLE-MACOMBER Motor Car Co., 1350 S. Michigan Ave., Chicago, Ill.

ELCAR—See Elkhart Carriage & Motor Car Co.

ELCO—See Bimel Automobile Co.

ELGIN Motor Car Corp., Chicago, Ill. (See page 283.)

ELKHART Carriage & Motor Car Co., Elkhart, Ind. "Elcar." (See page 349.)

EMPIRE Automobile Co., Indianapolis, Ind. (See page 349.)

ENGER Motor Car Co., 2100 Gest St., Cincinnati, O.

ERIE Motor Car Co., Painesville, O.

FARMACK Motor Car Corp., 76th & Wallace Sts., Chicago, Ill. (See page 539.)

F-I-A-T Co., North Rd., Poughkeepsie, N. Y.

FIRESTONE—See New Columbus Buggy Co.

FLAGLER Cycle Car Co., 2829 N. Halsted St., Chicago, Ill.

FORD Motor Co., Woodward Ave., Detroit, Mich.

FOSTORIA Light Car Co., Arizona Ave., Fostoria, O. (See page 349.)

FRANKLIN Mfg. Co., H. H., 101 W. Marcellus St., Syracuse, N. Y.

GABRIEL Auto Co., 315 Prospect Ave., N. W., Cleveland, O. (See page 57.)

GLIDE—See Bartholomew Co.

GRANT Motor Car Corp., Findlay, O. (See page 427.)

HALLADAY—See Barley Mfg. Co.

HARDING Motor Car Co., Cuyahoga Bldg., Cleveland, O.

HARVARD—See Pioneer Motor Car Co.

HATFIELD—See Cortland Cart & Carriage Co.

HAYNES Automobile Co., 11 S. Main St., Kokomo, Ind. (See page 55.)

HERCULES Motor Car Co., 1000-08 Vincennes St., New Albany, Ind.

HODGETTS Mfg. Co., W. J., 53 Academy St., Wallingford, Conn.

HOLLIER—See Lewis Spring & Axle Co.

HUDSON Motor Car Co., Detroit, Mich. (See page 55.)

HUPMOBILE—See Hupp Motor Car Co.

HUPP Motor Car Co., Mt. Elliott & Milwaukee Aves., Detroit, Mich. "Hupmobile."

IMPERIAL—See Mutual Motors Co.

INTER-STATE Motor Co., 900 W. Willard St., Muncie, Ind.

JACK RABBIT—See Apperson Bros., Automobile Co.

JACKSON Automobile Co., Jackson, Mich. (See page 349.)

JEFFERY Co., Thomas B., Kenosha, Wis. (See page 561.)

JONES Motor Car Co., 210-12 W. Douglas St., Wichita, Kans.

JORDON Motor Car Co., Swetland Bldg., Cleveland, O.

KEARNS Motor Truck Co., Beavertown, Pa.

KELLER Cyclecar Co., 143 N. Dearborn St., Chicago, Ill.

KING Motor Car Co., 1300 Jefferson Ave., E., Detroit, Mich.

KISSEL KAR—See Kissel Motor Car Co.

KISSEL Motor Car Co., 121 Kissel Ave., Hartford, Wis. "Kissel Kar."

KLINE Motor Car Co., North West Blvd., Richmond, Va.

LAMBERT—See Buckeye Mfg. Co.

LAUGHLIN Engineers' Corp., Homer, 2652 Long Beach Ave., Los Angeles, Cal.

LAUREL Motor Car Co., Richmond, Ind.

LENOX Motor Car Co., 60 Factory St., Hyde Park, Mass.

LEWIS Spring & Axle Co., 42 Hollier St., Chelsea, Mich. "Hollier."

LEXINGTON-HOWARD Co., 500 Park Pl., Connersville, Ind. (See page 57.)

LIBERTY Motor Car Co., 115 Lycaste St., Detroit, Mich.

LOCOMOBILE Co. of America, 2 Main St., Bridgeport, Conn.

LOZIER Co., H. A., E. 72d St., Cleveland, O.

LOZIER Motor Co., Detroit, Mich. (See page 369.)

LUVERNE Automobile Co., Maple & McKenzie Sts., Luverne, Minn.

McFARLAN Motor Co., Mount & High Sts., Connersville, Ind.

MADISON Motors Co., Anderson, Ind.

MAIBOHM Motors Co., Racine, Wis.

MALCOLM Motor Car Co. of New York, 612 E. 83d St., New York, N. Y.

MARION—See Mutual Motors Co.

MARMON—See Nordyke & Marmon Co.

MAXWELL Motor Co., Detroit, Mich. (See page 355.)

MERCER Automobile Co., 500 Whitehead Rd., Trenton, N. J.

METEOR Motor Car Co., 333 Spring St., Piqua, O.

METZ Co., Main & Gore Sts., Waltham, Mass.

MINO Cyclecar Co., 3521 Palmyra St., New Orleans, La.

MITCHELL-LEWIS Motor Co., Racine, Wis. (See page 63.)

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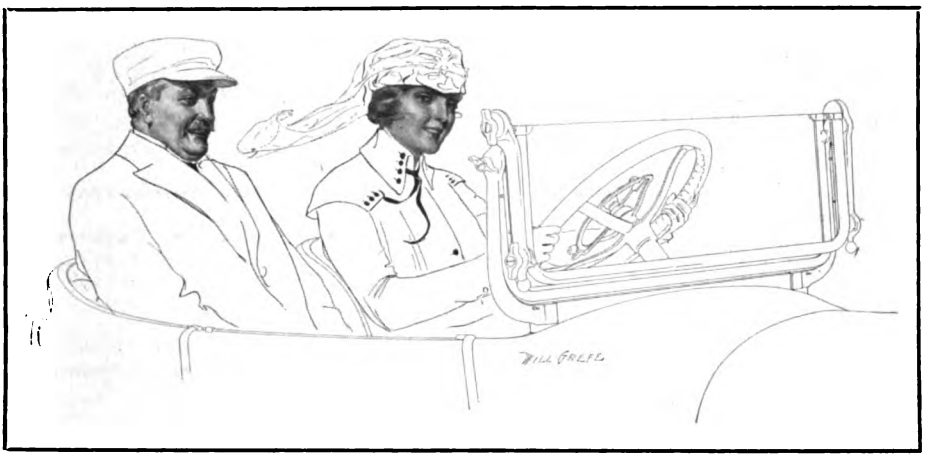

The owner of a New

PEERLESS EIGHT

is in possession of

one of the greatest motor car values ever produced

He has Profited by the high development of the Peerless Manufacturing and Metallurgical Departments, and by our concentration on the building of this one model.

He enjoys Luxury, unimpeachable style and ease-of-riding developed through long years of experience. These are characteristics for which Peerless motor cars have always been famous among the few great makes that dominate the quality market in America.

Master of Hills and hard going, he sees on the road no exhibition of speed or get-away to excite his envy.

His Ownership of a *new* model is secure.

Changes made for the sole purpose of stimulating sales impose premature depreciation upon the owner of the superseded model and cannot result in any lasting benefit to the manufacturer or the industry.

This Company is committed to the more equitable policy of making changes in its product only when these changes result in real improvement.

Touring $1890 Peerless ALL THAT THE NAME IMPLIES **Roadster $1890**

THE PEERLESS MOTOR CAR COMPANY CLEVELAND, OHIO

(Licensed under Kardo Company Patents)

Makers also of PEERLESS TRUCKS

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PLEASURE VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

MOLINE Automobile Co., 44 Keokuk St., East Moline, Ill.

MONARCH Motor Car Co., Walker & Woodbridge Sts., Detroit, Mich.

MONROE Motor Co., Pontiac, Mich.

MOON Motor Car Co., St. Louis, Mo.
(See page 539.)

MOORE Motor Co., 501 First Ave., N. E., Minneapolis, Minn.

MORSE Cyclecar Co., Farmer's Bank Bldg., Pittsburgh, Pa.

MT. PLEASANT Motor Car Co., W. High St., Mt. Fleasant, Mich.

MURRAY Motor Car Co., 3700 Grant Blvd., Pittsburgh, Pa.

MUTUAL Motors Co., Ganson & Wisner Sts., Jackson, Mich. "Marion," "Imperial."

NATIONAL Motor Vehicle Co., Indianapolis, Ind.
(See page 259.)

NEW Columbus Buggy Co., Dublin Ave., Columbus, O. "Firestone."

NEW ERA Engineering Co., Joliet, Ill.

NIAGARA Motor Car Corp., Gluck Bldg., Niagara Falls. N. Y.

NORDYKE & Marmon Co., 1101-31 W. Morris St., Indianapolis, Ind. "Marmon."

NORWALK Motor Car Co., Martinsburg, W. Va.

OAKLAND Motor Co., Pontiac, Mich.

OGREN Motor Works, New York Life Bldg., Chicago, Ill.

OLDS Motor Works, Division St., Lansing, Mich. "Oldsmobile."

OLDSMOBILE—See Olds Motor Works.

OVERLAND—See Willys-Overland Co.

OWEN-SCHOENECK Co., 2218 Cottage Grove Ave., Chicago, Ill.

PACKARD Motor Car Co., N. Grand Blvd. & Belt Line, Detroit, Mich.

PAIGE-DETROIT Motor Car Co., Detroit, Mich.
(See page 369.)

PARTIN-PALMER—See Commonwealth Motors Co.

PATERSON Co., W. A., Flint, Mich.
(See page 355.)

PATHFINDER Co., Indianapolis, Ind.
(See page 59.)

PEERLESS Motor Car Co., Cleveland, O.
(See page 49.)

PIERCE Arrow Motor Car Co., 1695 Elmwood Ave., Buffalo, N. Y.

PILGRIM Motor Car Co., Detroit, Mich.

PILLIOD Motor Co., Toledo, O.

PILOT Motor Car Co., Fort Wayne Ave., Richmond, Ind.

PIONEER Motor Car Co., 17 First St., Troy, N. Y. "Harvard."

PORTER Co., Finley Robertson, Main St., Port Jefferson, N. Y.

PORTLAND Cycle Car Co., Corbett Bldg., Portland, Ore.

PREMIER Motor Corp., Indianapolis, Ind.
(See page 369.)

PRINCESS Motor Car Co., 1305 Bellevue Ave., Detroit, Mich.

PULLMAN Motor Car Co., 244 N. George St., York, Pa.

RAYFIELD Motor Co., Chrisman, Ill.

REGAL Motor Car Co., Detroit, Mich.

REMINGTON Motor Co., 2 Columbus Circle, Kingston, N. Y.

REO Motor Car Co., S. Washington Ave., Lansing, Mich.

REPUBLIC Motor Car Co., Hamilton, O.

REX Motor Co., Labadie St. (Ford City), Wyandotte, Mich.

REXROAD Engineering Co., 705-07 S. Main St., Hutchinson, Kans.

ROSS Automobile Co., Detroit, Mich.

S J R Motor Co., 126 Massachusetts Ave., Boston, Mass.
(See page 371.)

SALTER Motor Mfg. Co., 1516-18 Oakland Ave., Kansas City, Mo.

SALVADOR Motor Co., 126 Massachusetts Ave., Boston, Mass.

SAXON Motor Car Co., Beaufait & Waterloo Aves., Detroit, Mich.

SCRIPPS-BOOTH Co., Detroit, Mich.
(See page 427.)

SEBRING Motor Car Co., Sebring, O.

SIMPLEX Automobile Co., New Brunswick, N. J.

SINGER Motor Co., 102-04 West End Ave., New York, N. Y.

SPAULDING Mfg. Co., Grinnell, Ia.

SPEEDWELL Motor Car Co., Dayton, O.

SPENNY Motor Car Co., 10 S. La Salle St., Chicago, Ill.

SPHINX Motor Car Co., N. Duke St. & P. R. R., York, Pa.

STAFFORD Motor Car Co., 22d & Campbell Sts., Kansas City, Mo.

STANDARD Cyclecar Co., 1748 W. Madison St., Chicago, Ill.

STANDARD Steel Car Co., Pittsburgh, Pa.
(See page 259.)

STEARNS Co., F. B., Cleveland, O.
(See page 259.)

STECO—See Stephens Co.

STEPHENS Co., 7329 Bond Blvd., Chicago, Ill. "Steco."

STEPHENS Motor Branch of Moline Plow Co., Freeport, Ill.
(See page 561.)

STERLING Automobile Mfg. Co. of New York, 1790 Broadway, New York, N. Y.
(See page 61.)

STERLING Motor Car Co., 705 Center St., Brockton, Mass.

STEWART Motor Corp., Superior & Randall Sts., Buffalo, N. Y.

STUDEBAKER Corp. of America, Piquette Ave. & Brush St., Detroit, Mich.

STUTZ Motor Car Co., Indianapolis, Ind.
(See page 53.)

SUN Motor Car Co., Elkhart, Ind.
(See page 219.)

SWAN Motor Car Co., Indianapolis, Ind.

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1917—"5-15" Five Passengers, 115-inch wheelbase, $1090 Detroit

Colors: Oriford maroon or Meteor blue with black wheels and gold striping.

1917—"7-22" Seven Passengers, 122-inch wheelbase, $1280 Detroit

Colors: Choice of Chalmers natural gray with black band and gold striping; black wheels with gold striping; or Chalmers Meteor blue, with black band and gold striping; black wheels with gold striping.

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Detroit, Mich., U.S.A.

Quality First

Here Is One of the Two New 1917 3400 r.p.m. Chalmers

Announcement of which is being made this and next week in the Saturday Evening Post, Collier's, Literary Digest, Life and Christian Herald. Two-page spreads in colors. Also full-pages in 1600 newspapers. Most of the 1467 Chalmers dealers now have the new cars on display. Both cars are 3400 r. p. m 's. Each is backed by 1,000,000 miles of use. The equivalent of 38 times around the equator.

The only difference between the two chassis is in the wheelbase. There is one power plant. Two chassis lengths (115 and 122 inches). Seven styles of bodies for the seven uses of an automobile. So that every Chalmers dealer has a full line of cars for the year-round trade. The new five-color catalog (a selling classic) is already in every Chalmers store in America.

CHALMERS MOTOR COMPANY, Detroit

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PLEASURE VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

THOMAS Motor Car Co., E. R., 1227-29 Main St., Buffalo, N. Y.

TIME Mfg. Co., Oostburg, Wis.

TISCHER Tri-Car Co., Linton G., 912 N. Jefferson Ave., Peoria, Ill.

TRIUMPH Motor Car Co., 3308 Sheffield Ave., Chicago, Ill.

UNION Car Co., I. W. Hellman Bldg., Los Los Angeles, Cal.

UNITED STATES Carriage Co., 309-19 S. Fourth St., Columbus, O.

VELIE Motor Vehicle Co., Velie Pl., Moline, Ill.

VICTOR Car Co., 2701-11 Diamond St., Philadelphia, Pa.

WASHINGTON Motor Car Co., Hyattsville, Md.

WESTCOTT Motor Car Co., 12th & N. E. Sts., Richmond, Ind.

WHITE Co., 842 E. 79th St., Cleveland, O.

WILLYS-OVERLAND Co., Toledo, O. "Overland."
(See page 46.)

WINTON Co., 10601 Berea Rd., Cleveland, O.

WOODS Mobilette Co., 1509 Michigan Ave., Chicago, Ill.
(See page 371.)

ELECTRIC VEHICLES

ANDERSON Electric Car Co., Riopelle St. & Clay Ave., Detroit, Mich. "Detroit."

BAILEY & Co., S. R., Chestnut St. & Railroad Ave., Amesbury, Mass.

BAKER R & L Co., Cleveland, O. "Rauch & Lang."
(See page 373.)

BEARDSLEY Electric Co., 1250-60 W. Seventh St., Los Angeles, Cal.

CENTURY Mfg. Co., 11-19 Lothrop Ave., Detroit, Mich.

DETROIT—See Anderson Electric Car Co.

DUDLY Tool Co., Menominee, Mich.

FIRESTONE—See New Columbus Buggy Co.

FRITCHLE Automobile & Battery Co., 1510-30 Clarkson St., Denver, Colo.

J. L. B. Motor Co., Fourth & St. Clair Sts., Dayton, O.

MILBURN Wagon Co., 3134 Monroe St., Toledo, O.

NEW COLUMBUS Buggy Co., Dublin Ave., Columbus, O. "Firestone."

OHIO Electric Car Co., 1501-07 W. Bancroft St., Toledo, O.

PRIGG Co., H. Paul, Converse, Ind.

RAUCH & LANG—See Baker R & L Co.

WALKER Vehicle Co., 531-45 W. 39th St., Chicago, Ill.

WAVERLEY Co., 129 S. East St., Indianapolis, Ind.

WOODS Motor Vehicle Co., Cottage Grove, Calumet & 25th St., Chicago, Ill.

STEAM VEHICLES

ROSS, Louis S., 88 Crafts St., Newtonville, Mass.

STANLEY Motor Carriage Co., 44 Hunt St., Newton, Mass.

IMPORTED VEHICLES

ADAMS, Thomas Evarts, 242 W. 59th St., New York, N. Y. "Lancia."

AUSTRIAN-DAIMLER—See Healey & Co.

BENZ Motor Co., 133 Amsterdam Ave., New York, N. Y.

BREWSTER & Co., Queensboro Bridge Plaza, Long Island City, N. Y. "Delauney-Belleville."

CAVALIERI, R. A., 108 W. 57th St., New York, N. Y. "Napier."

CRYDER & Co., 583 Park Ave., New York, N. Y. "Leon Bollee."

DAIMLER Mfg. Co., 1784 Broadway, New York, N. Y.

DE DION-BOUTON Selling Branch, 1649 Broadway, New York, N. Y.

DELAUNEY-BELLEVILLE—See Brewster & Co.

DEMAREST & Co., A. T., Broadway & 57th St., New York, N. Y. "Itala."

FIAT Automobile Co., 1776 Broadway, New York, N. Y.

FOREIGN & Domestic Auto Repair Co., 133 Amsterdam Ave., New York, N. Y.

HEALEY & Co., Broadway & 51st St., New York, N. Y. "Austrian-Daimler," "Panhard."

ISOTTA Fraschini Motors Co., 1920 Broadway, New York, N. Y.

ITALA—See Demarest & Co., A. T.

LANCIA—See Adams, Thomas Evarts.

LEON BOLLEE—See Cryder & Co.

MERCEDES Repair Co., 159 E. 54th St., New York, N. Y.

NAPIER—See Cavalieri, R. A.

PANHARD—See Healey & Co.

PEUGEOT Auto Import Co., 1620 Broadway, New York, N. Y.

RENAULT Selling Branch, 719 Fifth Ave., New York, N. Y.

ROLLS ROYCE—See Schutte, R. W.

SCHUTTE, R. W., 236 W. 54th St., New York, N. Y. "Rolls Royce."

COMMERCIAL VEHICLES

GASOLINE VEHICLES

ACASON Motor Truck Co., 291 12th St., Detroit, Mich.
(See page 373.)

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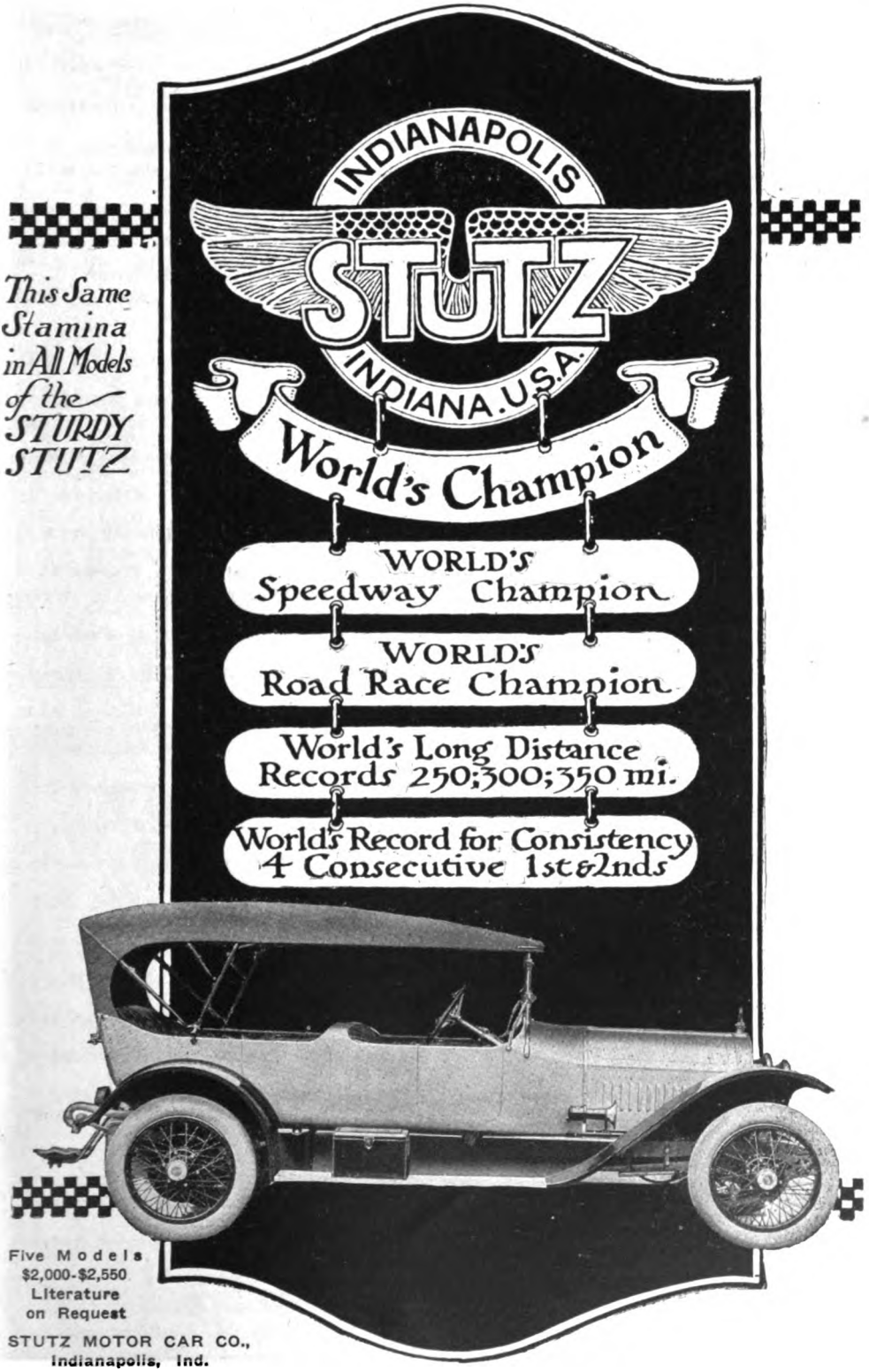

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COMMERCIAL VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

ACME Motor Truck Co., 808 E. Woodbridge St., Detroit, Mich.

ADAMS Truck, Foundry & Machine Co., 419-33 W. Main Cross St., Findlay, O.

ADMIRAL Motor Car Co., St. Louis, Mo.

AMERICAN Motor Truck Co., 1328 Broadway, New York, N. Y.

AMERICAN & British Mfg. Co., Charles & Cross Sts., Providence, R. I.

ARMLEDER Co., O., Plum, Charles & 12th Sts., Cincinnati, O.

ATTERBURY Motor Car Co., Buffalo, N. Y. (See page 377.)

AUGLAIZE Motor Car Co., New Bremen, O.

AUTOCAR Co., Lancaster Ave., Ardmore, Pa.

AVAILABLE Truck Co., 1539 N. Kilpatrick Ave., Chicago, Ill.

AVERY Co., 949 Iowa St., Peoria, Ill.

BARKER, C. L., Norwalk, Conn.

BECK & Son, 901-13 First Ave., W., Cedar Rapids, Ia.

BELL Motor Car Co., York, Pa. (See page 221.)

BESSEMER Motor Truck Co., Grove City, Pa. (See page 259.)

BINGHAM Mfg. Co., N. Y. Central & Lorain St., West Park, O.

BLAIR Motor Truck Co., 16th St. & B. & O. R. R., Newark, O.

BOWLING Green Motor Truck Co., Bowling Green, O. "Modern." (See page 57.)

BRASIE Motor Car Co., 2743-45 Lyndale Ave., S. Minneapolis, Minn.

BROCKWAY Motor Truck Co., 106 Railroad St., Cortland, N. Y.

BROOKS-LATTA Automobile Mfg. Co., 4366 Finney Ave., St. Louis, Mo.

BUCKEYE Mfg. Co., 1801-09 Columbus Ave., Anderson, Ind.

BUICK Motor Co., Hamilton Ave., Flint, Mich.

BURFORD Co., H. G., Fremont, O.

CADILLAC Auto Truck Co., 10 Mitchell St., Cadillac, Mich. "Acme." (See page 283.)

CHASE Motor Truck Co., West St., Syracuse, N. Y. (See page 367.)

CHICAGO Pneumatic Tool Co., 343 S. Dearborn St., Chicago, Ill. "Little Giant."

CINCINNATI Motors Mfg. Co., 1743-45 Central Ave., Cincinnati, O.

CLARK, Edward S., 242 Freeport St. (Dorchester), Boston, Mass.

CLARK Delivery Car Co., 1035 E. 76th St. (Grand Crossing), Chicago, Ill.

CLEBURNE Motor Car Mfg. Co., Cleburne, Texas.

COLEMAN Carriage & Harness Co., F., Morgan & Main Sts., Ilion, N. Y.

COLUMBIA Motor Truck & Trailer Co., Pontiac, Mich.

COMMER—See Commercial Cars.

COMMERCE Motor Car Co., Detroit, Mich. (See page 283.)

COMMERCIAL Cars, 453 W. 129th St., New York, N. Y. "Commer." (Importers.)

COMMERCIAL Truck Co., Cleveland, O. "Trojan."

CONTINENTAL Truck Mfg. Co., 1702 16th St., Superior, Wis.

CORBITT Automobile Co., Henderson, N. C.

CORLISS Motor Truck Co., Corliss, Wis. (See page 371.)

CORTLAND Cart & Carriage Co., Motor Dept., Sidney, N. Y. "Hatfield." (See pages 298 and 299.)

COUPLE-GEAR Freight-Wheel Co., 1450 Buchanan St., Grand Rapids, Mich.

CRAWFORD Automobile Co., Surrey & Summit Aves., Hagerstown, Md.

CROCE Auto Co., Asbury Park, N. J.

CUNNINGHAM, Son & Co., James, 18 Canal St., Rochester, N. Y.

CURTIS—See Pittsburg Machine Tool Co.

DANIELSON Engine Works, 339-41 E. 39th St., Chicago, Ill.

DART Motor Truck Co., Ainsborough & Stratford Aves., Waterloo, Ia.

DE KALB Wagon Co., 229 Garden St., De Kalb, Ill.

DENBY Motor Truck Co., Holbrook St. & G. T. R. R., Detroit, Mich.

DETROIT Commercial Car Co., Pontiac, Mich.

DETROIT-WYANDOTTE Motor Co., Wyandotte, Mich. "Horner."

DEVON Engineering Co., 2019-35 Washington Ave., Philadelphia, Pa.

DIAMOND T. Motor Car Co., 432 W. Superior St., Chicago, Ill.

DISPATCH Motor Car Co., 14th Ave., S. E., & Winter St., Minneapolis, Minn.

DOANE Motor Truck Co., 425 Fourth St., San Francisco, Cal.

DORRIS Motor Car Co., 4112 Laclede Ave., St. Louis, Mo.

DRUMMOND Motor Co., 2568-72 Farnam St., Omaha, Neb.

DUPLEX Power Car Co., Lovell & Pearl Sts., Charlotte, Mich.

ELMIRA Commercial Motor Car Co., Owego, N. Y.

EMPIRE Motor Truck Corp., rear 30 River St., Troy, N. Y.

ERIE Motor Truck Mfg. Co., 220 W. 12th St., Erie, Pa.

FAMOUS Mfg. Co., Chicago & Railroad Aves., East Chicago, Ind.

FARGO Motor Car Co., 1164-66 W. 22d St., Chicago, Ill.

FEDERAL Motor Truck Co., Detroit, Mich.

FORSYTHE Mfg. Co., 319 E. Third St., Joplin, Mo.

FOSTORIA Light Car Co, Arizona Ave., Fostoria, O. (See page 349.)

FOUR Wheel Drive Auto Co., 501 Main St., Clintonville, Wis.

GABRIEL Auto Co., 315 Prospect Ave., N. W., Cleveland, O. (See page 57.)

GARFORD Motor Truck Co., Lima, O. (See page 369.)

GARY Motor Truck Co., 610 Broadway, Gary, Ind.

GAY Co., S. G., Ottawa, Ill.

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Hudson Super-Six Proves Its Marvelous Endurance

The last question—the question of endurance—has been proven conclusively by the Hudson Super-Six. Its 1819 mile trip in 24 hours never has been matched by any traveling machine. In all other ways, it long has been evident that the Super-Six stands supreme. Never has a motor of this size shown anywhere near such power. Never was an engine made to match this in smoothness. Never has a stock car recorded equal performance in hill climbing, quick acceleration, or absolute speed. Handsomer cars have never been shown. Finer engineering is simply unthinkable. You are getting the car of the day when you get the Super-Six. Every man who knows the fact knows that, and in view of our patent rivalry is impossible.

Seven-passenger Phaeton $1475 at Detroit
Seven other styles of open and closed bodies

Hudson Motor Car Company, Detroit, Michigan

THE HAYNES

America's Greatest "Light Six"

A High Speed High Power

Motor, an adaptability for all conditions of travel, an excellent equipment, have made the Haynes "Light Six" the most popular car in its class

TWO MODELS—THREE BODY STYLES

Model 36—Five-passenger touring car, 121" wheelbase.....$1485
Model 36—The So-Sha-Belle roadster—3-passenger..... 1485
Model 37—Seven-passenger touring car, 127" wheelbase..... 1585

All prices f.o.b. Kokomo, Indiana

THE HAYNES AUTOMOBILE COMPANY
11 SOUTH MAIN STREET KOKOMO, INDIANA

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COMMERCIAL VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

GENERAL Motors Truck Co., Pontiac, Mich.

GERLINGER Motor Car Co., E. Third & Oregon Sts., Portland, Ore.

GLOBE Furniture Co., Northville, Mich. (See page 221.)

GOLDEN West Motors Co., Ochsner Bldg., Sacramento, Cal.

GRAMM-BERNSTEIN Co., Lima, O. (See page 367.)

HAHN Motor Truck & Wagon Co., S. Fourth St., Hamburg, Pa.

HALL—See Lewis-Hall Iron Works.

HANNIBAL Wagon Co., Hannibal, Mo.

HARDER Auto-Truck Co., 40th St. & Calumet Ave., Chicago, Ill.

HARRISON Co., Robert, 324-28 W. First St., (S. Boston), Boston, Mass.

HARVEY Motor Truck Wks., Harvey, Ill.

HASCALL Motor Truck Co., Painesville, O.

HATFIELD—See Cortland Cart & Carriage Co.

HAWKEYE Mfg. & Repair Co., 313-15 Jennings St., Sioux City, Ia.

HENDERSON Bros., 2067 Massachusetts Ave. (N. Cambridge), Cambridge, Mass.

HENDRICKSON Motor Truck Co., 3538-40 S. Wabash Ave., Chicago, Ill.

HEWITT—See International Motor Co.

HEWITT-LUDLOW Auto Co., San Francisco, Cal.

HODGETTS Mfg. Co., W. J., 53 Academy St., Wallingford, Conn.

HOFFMAN Motor Car Co., 38th St. & University Ave., N. E., Minneapolis, Minn.

HOMER Motors Co., 815 W. Seventh St., Los Angeles, Cal.

HORNER—See Detroit-Wyandotte Motor Co.

HOUGHTON Motor Car Co., Marion, O.

HURLBURT Motor Truck Co., Third Ave. & Harlem River, New York, N. Y.

HYDRAULIC Truck Co., Central Bldg., Los Angeles, Cal.

ICE Mfg. Co., 1480 Broadway, New York, N. Y.

INDIANA Truck Co., 454 Indiana Ave., Marion, Ind. (See page 367.)

INTERNATIONAL Harvester Co. of America, Chicago, Ill. (See page 539.)

INTERNATIONAL Motor Co., 64th St. & West End Ave., New York, N. Y. "Mack," "Saurer," "Hewitt."

JEFFERY Co., Thomas B., Kenosha, Wis. (See page 561.)

JEWETT Car Co., Newark, O. (See page 603.)

JUNO Motor Truck Co., Juneau, Wis.

KELLY-SPRINGFIELD Motor Truck Co., Burt St. & Sheridan Ave., Springfield, O.

KENTUCKY Wagon Mfg. Co., Third & K Sts., Louisville, Ky. "Old Hickory."

KING Mfg. Co., A. R., Kingston, N. Y.

KISSEL Motor Car Co., 121 Kissel Ave., Hartford, Wis.

KLEIBER & Co., 1424-40 Folsom St., San Francisco, Cal.

KNOX Motors Associates, 53 Wilbraham Rd., Springfield, Mass.

KOEHLER, S. G., Co., H. J., Fourth Ave. & Erie R. R., Newark, N. J.

KREBS Commercial Car Co., 439 Amanda St., Clyde, O.

KRICKWELL Motor Truck Co., 1873 E. 55th St., Chicago, Ill.

LANDSHAFT & Son, Wm., 2900 Darwin Terrace, Chicago, Ill.

LANGE Motor Truck Co., 145 S. St. Clair St., Pittsburg, Pa.

LARRABEE-DEYO Motor Truck Co., Charles St., Binghamton, N. Y.

LENOX Motor Car Co., 60 Factory St., Hyde Park, Mass.

LEWIS-HALL Iron Works, Detroit, Mich. "Hall." (See page 283.)

LIPPARD-STEWART Motor Car Co., 226 W. Utica St., Buffalo, N. Y.

LITTLE GIANT—See Chicago Pneumatic Tool Co.

LOCOMOBILE Co. of America, 2 Main St., Bridgeport, Conn. "Riker."

LUVERNE Automobile Co., Maple & McKenzie Sts., Luverne, Minn.

McFARLAN Motor Co., Mount & High Sts., Connersville, Ind.

MACCAR Truck Co., Cliff St., Scranton, Pa.

MACK—See International Motor Co.

MENOMINEE—See Poyer & Co.

MERCHANT & Evans Co., Philadelphia, Pa. (See page 405.)

MERCURY Mfg. Co., 4110 S. Halsted St., Chicago, Ill.

METZ Co., Main & Gore Sts., Waltham, Mass.

MICHIGAN Hearse & Motor Co., Union Blvd. & P. M. R. R., Grand Rapids, Mich.

MISSION Motor Car Co., 1310-12 S. Grand Ave., Los Angeles, Cal.

MODERN—See Bowling Green Motor Truck Co.

MOELLER—See New Haven Truck & Auto Works.

MOGUL Motor Truck Co., 4125 Forest Park Blvd., St. Louis, Mo.

MOHAWK Motor Truck Co., Ravenna, O.

MOON Buggy Co., Jos. W., Main & Douglas Sts., St. Louis, Mo.

MOORE—See Pacific Metal Products Co.

MORELAND Motor Truck Co., 1701 N. Main St., Los Angeles, Cal.

MORTON Truck & Tractor Co., 19th & Manada Sts., Harrisburg, Pa.

MYERS Machine Co., 1002-18 Indiana Ave., Sheboygan, Wis.

NELSON & Le Moon, 815 N. Kedzie Ave., Chicago, Ill.

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Complete Line At Right Prices

1-1½-2-3½-5 Ton Models

Service Motor Trucks

Dealers Making Big Money

Get Details of Proposition

SERVICE MOTOR TRUCK CO., WABASH, INDIANA

MODERN 1915

GET IN LINE

With your co-operation, we are able to supply you with just the truck that will give the most satisfactory and profitable results in your business—Chain or Worm drive models.

Model "H" 1½ Ton Chain Drive.
Model "M" 1½ Ton Worm Drive.
Model "L" 1 Ton Worm Drive.
Model "P" 2 Ton Chain Drive.

The Bowling Green Motor Truck Co., Bowling Green, Ohio

THE LEXINGTON-HOWARD CO.
Lexington
CONNERSVILLE, IND. U.S.A.

Profitable to the Dealer because of owner satisfaction and real factory co-operation.

The Lexington line includes the Thoroughbred Six—a revelation to discriminating buyers, the Six De Luxe—for the big car customers, and the Minute Man—model attracting prospects with smaller requirements.

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HIGH GRADE
GABRIEL
MOTOR TRUCKS

Hand-Built to Meet the Severe Handling Needs of Exacting Truck Users.

1500 to 3000 lbs.

Ask for 1916 Catalog and complete specifications.

The Gabriel Auto. Co.

315 Prospect Ave., N. W.

CLEVELAND, OHIO

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COMMERCIAL VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

METCO—See New England Truck Co.

NEVADA Truck & Tractor Co., Nevada, Ia.

NEW England Truck Co., Lunenburg & Congress Sts., Fitchburg, Mass. "Metco."

NEW Haven Truck & Auto Works, 166-68 St. John St., New Haven, Conn. "Moeller."

NILES Car & Mfg. Co., Erie St., Niles, O.

NORWALK Motor Car Co., Martinsburg, W. Va.

OLD HICKORY—See Kentucky Wagon Mfg. Co.

OLD Reliable Motor Truck Co., 3921 S. Michigan Ave., Chicago, Ill.

PACIFIC Metal Products Co., Carson St., Torrance, Cal. "Moore."

PACKARD Motor Car Co., N. Grand Blvd. & Belt Line, Detroit, Mich.

PALMER-MEYER Motor Car Co., 5027-35 McKissock Ave., St. Louis, Mo.

PALMER-MOORE Co., 110 N. Geddes St., Syracuse, N. Y.

PATRICK Corp., Empire State Bldg., Spokane, Wash.

PAULDING—See St. Louis Motor Truck Co.

PEERLESS Motor Car Co., Cleveland, O. (See page 49.)

PIERCE Arrow Motor Car Co., 1695 Elmwood Ave., Buffalo, N. Y.

PITTSBURG Machine Tool Co., Corey Ave., Braddock, Pa. "Curtis."

POYER Co., D. F., Saxton Ave., Menominee, Mich. "Menominee."

PULL-MORE Motor Truck Co., Dime Bank Bldg., Detroit, Mich.

RAVENNA Motor Truck Co., Ravenna, O.

REO Motor Car Co., S. Washington Ave., Lansing, Mich.

REPUBLIC Motor Truck Co., Alma, Mich. (See page 371.)

REXROAD Engineering Co., 705-07 S. Main St., Hutchinson, Kans.

RIKER—See Locomobile Co. of America.

ROBINSON Fire Apparatus Mfg. Co., 4250-68 N. 20th St., St. Louis, Mo.

ROBINSON Motor Truck Co., Second Ave. & Seventh St., Minneapolis, Minn.

ROTO Motor Car Corp., Hannibal, Mo.

ROWE Motor Mfg. Co., Wallace Ave., Downingtown, Pa.

RUSH Delivery Car Co., 1007 N. Front St., Philadelphia, Pa.

SAFETY First Motor Car & Truck Co., Main St., Plainwell, Mich.

ST. LOUIS Motor Truck Co., 4274-76 Easton Ave., St. Louis, Mo. "Paulding."

SALTER Motor Mfg. Co., 1516-18 Oakland Ave., Kansas City, Mo.

SANDOW Truck Co., 2916-24 W. Lake St., Chicago, Ill.

SANFORD Motor Truck Co., W. Fayette St. & St. Marks Pl., Syracuse, N. Y.

SAURER—See International Motor Co.

SAXON Motor Car Co., Beaufait & Waterloo Aves., Detroit, Mich.

SAYERS & Scovill Co., 2247-61 Colerain Ave., Cincinnati, O.

SCHACHT Motor Truck Co., G. A., Cincinnati, O. (See page 561.)

SCHLEICHER Motor Vehicle Co., Ossining, N. Y.

SELDEN Motor Vehicle Co., University Ave. & Probert St., Rochester, N. Y.

SERVICE Motor Truck Co., Wabash, Ind. (See page 57.)

SHERIDAN Commercial Car Co., Harvey, Ill.

SIEBERT, Shop of, Southard Ave., Toledo, O.

SIGNAL Motor Truck Co., Detroit, Mich. (See page 377.)

SOUTH Bend Motor Car Works, South Bend, Ind. (See page 541.)

SPEEDWELL Motor Car Co., Dayton, O.

STANDARD Motor Truck Co., Detroit, Mich.

STAPF & Co., John M., 228 Central Ave., Dunkirk, N. Y.

STAR Carriage Co., 2400 First Ave., S., Seattle, Wash.

STAR Motor Car Co., Summit & Wildt Sts., Ann Arbor, Mich.

STEARNS Co., F. B., Cleveland, O. (See page 259.)

STEELE, W. M., 98-100 Beacon St., Worcester, Mass.

STEGEMAN Motor Car Co., 906 Linus St., Milwaukee, Wis.

STERLING Motor Truck Co., 46th Ave. & Rogers St., West Allis, Wis.

STEWART Motor Corp., Superior & Randall Sts., Buffalo, N. Y.

STUDEBAKER Corp. of America, Piquette Ave. & Brush St., Detroit, Mich.

SULLIVAN Motor Car Co., 1703 East Ave., Rochester, N. Y.

SWAN Motor Car Co., Indianapolis, Ind.

TEETOR-HARTLEY Motor Co., Hagerstown, Ind.

TEGETMEIER & Riepe Co., 771-73 First Ave., New York, N. Y.

TIFFIN Wagon Co., Tiffin, O.

TRABOLD Truck Mfg. Co., 810-12 Railroad St., Johnstown, Pa.

TRANSIT Motor Truck Co., 18th & Burnett Sts., Louisville, Ky.

TRANSPORT Tractor Co., 87-93 Sunswick St., Long Island City, N. Y.

TRIPLE Tractor Truck Co., 319 Washington Ave., N., Minneapolis, Minn.

TRIUMPH Motor Car Co., 3308 Sheffield Ave., Chicago, Ill.

TROJAN—See Commercial Truck Co.

TWIN City Four Wheel Drive Co., 771 Raymond Ave., St. Paul, Minn.

UNION Car Co., I. W. Hellman Bldg., Los Angeles, Cal.

UNITED Motor Truck Co., 675 North St., N. W., Grand Rapids, Mich.

UNITED States Carriage Co., 309-19 S. Fourth St., Columbus, O.

UNITED States Motor Truck Co., Cincinnati, O.

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the "GREAT"

King of Twelves

$2750

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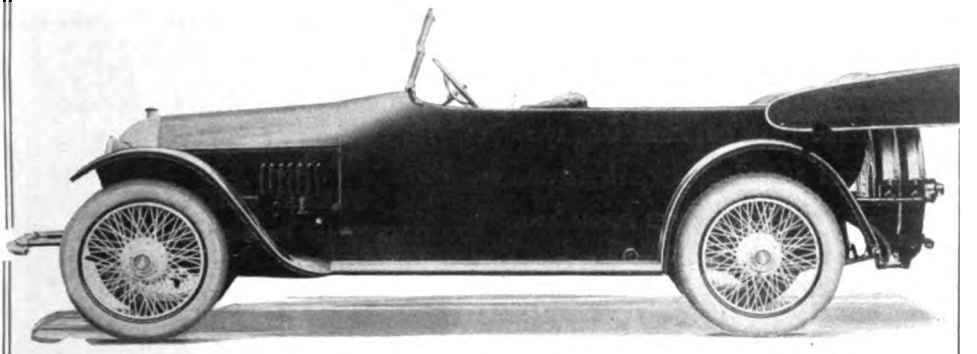
Built in the shops of Pathfinder



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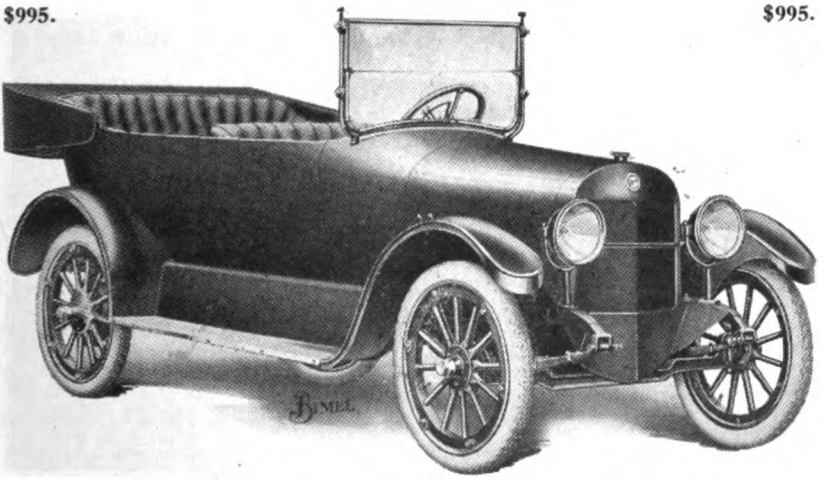
BIMEL SIX $995. **The New Model Bimel Six Touring Car.** **BIMEL SIX** $995.



The Bimel Automobile Co. succeeds the old Bimel Buggy Co., established in 1844, with a capitalization of $500,000.00 and announces a beautiful new model six cylinder car with a semi-boat and stream line effect as follows: Wheel base, 115"; Motor, 3⅛ x 5"; Tire, 32x4"; Weight, 2400 lbs., Full Floating Rear Axle, Crown Fenders, Rear Springs semi-elliptic 2 x 52", Genuine M.B. Leather, Large Honey Comb radiator, 15 gallon gasoline tank hung in rear; Stewart Warner Vacuum pump, speedometer, one man top, two unit Westinghouse starting and lighting system, Atwater Kent ignition, car painted black or dark green.

These cars are now under production and prompt shipments can be made. Write today for particulars and territory.

THE BIMEL AUTOMOBILE CO., Sidney, Ohio, U. S. A.

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COMMERCIAL VEHICLES (Continued)

GASOLINE VEHICLES (Continued)

UNIVERSAL Service Co., 1120 Grand River Ave., Detroit, Mich.

VEERAC Motor Co., Anoka, Minn.

VELIE Motor Vehicle Co., Velie Pl., Moline, Ill.

VIM Motor Truck Co., Philadelphia, Pa.

VOLTZ Bros., 840-44 S. Halsted St., Chicago, Ill.

WALTER Motor Truck Co., 49-51 W. 66th St., New York, N. Y.

WARE Motor Vehicle Co., 771 Raymond Ave., St. Paul, Minn.

WARREN Motor Truck Co., Dana Ave., Warren, O.

WASHINGTON Motor Car Co., Hyattsville, Md.

WEST Coast Wagon Co., 1948-52 Pacific Ave., Tacoma, Wash.

WHITE Co., 842 E. 79th St., Cleveland, O.

WICHITA Falls Motor Co., Wichita Falls, Tex.

WILCOX Motor Co., H. E., 1030 Marshall St., N. E., Minneapolis, Minn.

WILLINGHAM'S Sons, E. G., 540 Whitehall St., Atlanta, Ga.

WILSON Co., J. C., 15th & Warren Aves., Detroit, Mich.

WISCONSIN Motor Truck Works, 617-21 Oak St., Baraboo, Wis.

WITT-WILL Co., 52 N St., N. E., Washington, D. C.

ELECTRIC VEHICLES

ANDOVER Motor Vehicle Co., Haverhill St., Andover, Mass.

ATLANTIC Electric Vehicle Co., 893-97 Freylinghuysen Ave., Newark, N. J.

AUTOMATIC Transportation Co., 2933 Main St., Buffalo, N. Y.

BAKER R & L Co., Cleveland, O. (See page 373.)

BEARDSLEY Electric Co., 1250-60 W. Seventh St., Los Angeles, Cal.

CAPITOL Truck Mfg. Co., Empire Bldg., Denver, Colo.

COMMERCIAL Truck Co. of America, 27th & Brown Sts., Philadelphia, Pa.

COUPLE-GEAR Freight-Wheel Co., 1456 Buchanan St., Grand Rapids, Mich.

COVEL Mfg. Co., Benton Harbor, Mich. "Ross."

CYCO-ELECTRIC Car Co., 1790 Broadway, New York, N. Y.

ELDRIDGE Mfg. Co., 541 Tremont St., Boston, Mass.

FIELD Omnibus Co., 149 Broadway, New York, N. Y.

FRITCHLE Automobile & Battery Co., 1510-30 Clarkson St., Denver, Colo.

G. V.—See General Vehicle Co.

GALION Dynamic Truck Co., Primrose St., Galion, O.

GENERAL Motors Truck Co., Pontiac, Mich.

GENERAL Vehicle Co., Borden & Review Aves., Long Island City, N. Y. "G. V."

J. L. B. Motor Co., Fourth & St. Clair Sts., Dayton, O.

LANSDEN Co., Flatbush & Nostrand Aves., Brooklyn, N. Y.

MILBURN Wagon Co., 3134 Monroe St., Toledo, O.

PRIGG Co., H. Paul, Converse, Ind.

ROSS—See Covel Mfg. Co.

SHAFER-DECKER Co., 15 Circle St., Rochester, N. Y.

WALKER Vehicle Co., 531-45 W. 39th St., Chicago, Ill.

WARD Motor Vehicle Co., S. Fulton Ave., Mt. Vernon, N. Y.

WAVERLEY Co., 129 S. East St., Indianapolis, Ind.

STEAM VEHICLES

STANLEY Motor Carriage Co., 44 Hunt St., Newton, Mass.

IMPORTED VEHICLES

ARIES—See Jaccard & Co.

BENZ Motor Co., 133 Amsterdam Ave., New York, N. Y.

DE DION-BOUTON Selling Branch, 1649 Broadway, New York, N. Y.

FOREIGN & Domestic Auto Repair Co., 133 Amsterdam Ave., New York, N. Y.

HEALEY & Co., Broadway & 51st St., New York, N. Y. "Panhard."

JACCARD & Co., J., 213 W. 69th St., New York, N. Y. "Aries."

PANHARD—See Healey & Co.

TAXICABS

DETROIT Taxicab & Transfer Co., Detroit, Mich.

FORD Motor Co., Woodward Ave., Detroit, Mich.

PULLMAN Motor Car Co., 244 N. George St., York, Pa.

SHAW Livery Co., Walden W., 1006 S. Wabash Ave., Chicago, Ill.

THOMAS Motor Cab Co., 184-88 W. Mohawk St., Buffalo, N. Y.

WHITE Co., 842 E. 79th St., Cleveland, O.

MOTOR PROPELLED FIRE APPARATUS

ADAMS Truck, Foundry & Machine Co., 419-33 W. Main Cross St., Findlay, O.

AHRENS-FOX Fire Engine Co., Alfred & Cook Sts., Cincinnati, O.

AMERICAN-La France Fire Engine Co., Elmira, N. Y.

AMERICAN & British Mfg. Co., Charles & Cross Sts., Providence, R. I.

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Steel Trailers

Rogers Brothers Company

Manufacturers of

Steel Auto Trailers

FOR EVERY PURPOSE

½ to 5 ton capacity
Prices from $80.00 to $850.00

Write for Catalog

Some good territory still open for jobbers

ROGERS BROTHERS COMPANY
ALBION, PENNA.

The Sterling—New York—Roadster 1916

Specifications

MOTOR—Sterling 4-cylinder, water cooled, 3 x 4¼, overhead valves, unit power plant, selective sliding gear transmission, 3 speeds forward and reverse, thermo-syphon cooling, cylinders cast en bloc, detachable heads.
LUBRICATION—Self-contained, constant level, plunger pump and splash, individual oil pocket for each connecting rod dipper. Sight feed on dash.
CARBURETOR—Zenith, supplied by gravity from tank in cowl, filler cap on instrument board.
IGNITION—Unisparker system with spark advance.
CLUTCH—Large leather-faced cone, with springs under leather for smooth engagement.
DRIVE—Shaft through pinion and ring gear to rear axle.
REAR AXLE—Semi-floating, high grade materials and bearings throughout.
FRONT AXLE—Drop forged. I-beam with integral yokes; tie rod in rear of axle.
BRAKES—Two on rear wheel hubs, Raybestos lined.
WHEELS—Wood, artillery type, with large cup and ball bearing, demountable rims.
TIRES—Clincher, 30 x 3½ in.
STEERING GEAR—Irreversible split nut type, adjustable, 16-in. steering wheel, LEFT DRIVE.
CONTROL—Gear change lever conveniently located in center of body. Foot accelerator. Hand throttle on steering wheel. Left pedal for clutch, right pedal for service brake. Foot-operated emergency brake. CENTER CONTROL.
BODY—Streamline, with elevated cowl, wide doors, ample leg room, tufted upholstery.
CROWN FENDERS.
FRAME—Pressed steel channel section, extra strong.
SPRINGS—High grade spring steel, double heat treated. Front, semi-elliptic; rear, full cantilever; no side sway.
WHEELBASE—102 inches.
TREAD—56 inches (standard).
FINISH—Blue-black or grey.
STANDARD EQUIPMENT—Real, one-man-style mohair top, side curtains and dust cover; rain-vision ventilating windshield; electric lights, tail light and combination cowl and trouble light; electric or hand-operated horn; tire repair kit; set of tools and jack; speedometer. Also—

Two unit Auto-lite electric starting and lighting system, equipped with Eclipse-Bendix drive, battery included

Address Sales Department

Sterling Automobile Mfg. Co., Inc., of New York

1790 BROADWAY, N. Y.

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COMMERCIAL VEHICLES (Continued)

MOTOR PROPELLED FIRE APPARATUS (Continued)

ANDERSON Coupling & Fire Supply Co., Sixth St. & Reynolds Ave., Kansas City., Kans.

AUTOCAR Co., Lancaster Ave., Ardmore, Pa.

BOYD & Bro., Jas., 25th & Wharton Sts., Philadelphia, Pa.

BROCKWAY Motor Truck Co., 106 Railroad St., Cortland, N. Y.

COUPLE-GEAR Freight-Wheel Co., 1450 Buchanan St., Grand Rapids, Mich.

FEDERAL Motor Truck Co., Detroit, Mich.

FRONT Drive Motor Co., 16th St. & Willow Ave., Hoboken, N. J.

HALE Co., Geo. C., 119-21 W. 14th St., Kansas City, Mo.

HALLOCK Engineering Co., Hippodrome Bldg., Cleveland, O.

HOWE Engine Co., Indianapolis, Ind.

KELLY-SPRINGFIELD Motor Truck Co., Burt St. & Sheridan Ave., Springfield, O.

KISSEL Motor Car Co., 121 Kissel Ave., Hartford, Wis.

KNOX Motors Associates, 53 Wilbraham Rd., Springfield, Mass.

LIPPARD-STEWART Motor Car Co., 226 W. Utica St., Buffalo, N. Y.

LOCOMOBILE Co. of America, 2 Main St., Bridgeport, Conn.

LUITWEILER Pumping Engine Co., 123 Ames St., Rochester, N. Y.

MAXIM Motor Co., Wareham St., Middleboro, Mass.

NOTT Fire Engine Co., 1624 Central Ave., Minneapolis, Minn.

OLDS Motor Works, Division St., Lansing, Mich.

PACKARD Motor Car Co., N. Grand Blvd. & Belt Line, Detroit, Mich.

ROBINSON Fire Apparatus Mfg. Co., 4250-68 N. 20th St., St. Louis, Mo.

SCHNERR, J. J., 774-80 Golden Gate Ave., San Francisco, Cal.

SEAGRAVE Co., Columbus, O.

SOUTH Bend Motor Car Works, South Bend, Ind.
(See page 541.)

WATEROUS Engine Works Co., 62 S. Robert St., St. Paul, Minn.

WHITE Co., 842 E. 79th St., Cleveland, O.

GASOLINE TRACTORS

ADVANCE-RUMELY Thresher Co., La Porte, Ind.

AMERICAN Tractor Co., 310 South E. Ninth St., Des Moines, Ia.

AVERY Co., 949 Iowa St., Peoria, Ill.

BATES—See Joliet Oil Tractor Co.

BATES Tractor Co., Lansing, Mich.
(See page 541.)

BEST Gas-Traction Co., C. L., 105th Ave., Oakland, Cal.

BULL Tractor Co., 2700 University Ave., S. E., Minneapolis, Minn.

BULLOCK Engine Co., 143 N. Wabash Ave., Chicago, Ill.

C. O. D. Tractor Co., 307 Washington Ave., N., Minneapolis, Minn.

CASE T. M. Co., J. I., State St., Racine, Wis. "Wallis."

CHIEF Tractor Mfg. Co., Station A, Detroit, Mich.
(See page 541.)

COMMON Sense Gas Tractor Co., 622-28 Ninth St., S. E., Minneapolis, Minn.

CORN Belt Tractor Co., Minneapolis, Minn.

CROP MAKER—See Hart-Parr Co.

DAUCH Mfg. Co., Sandusky, O.

DAYTON-DICK Co., Quincy, Ill. "Leader."

DENNING Tractor Co., Cedar Rapids, Ia.

ELECTRIC Wheel Co., Quincy, Ill.

EMERSON-BRANTINGHAM Implement Co., Rockford, Ill.

FORD Tractor Co., 2619-27 University Ave., S. E., Minneapolis, Minn.

GRAY Tractor Mfg. Co., 1030 Marshall St., N. E., Minneapolis, Minn.

HAPPY Farmer Tractor Co., 324 Third Ave., N., Minneapolis, Minn.

HARROW Tractor Co., A. T., 12 Jefferson Ave., Detroit, Mich.

HART-PARR Co., Charles City, Ia. "Old Reliable," "Steel King," "Oil King," "Crop Maker," "Little Devil."

HAYWOOD Co., Newark, N. Y.

HOKE Tractor Co., 2101 S. Main St., South Bend, Ind.

HUBER Mfg. Co., Marion, O.

HUME Mfg. Co., Hume, Ill.

INTERNATIONAL Harvester Co. of America, Chicago, Ill.
(See page 539.)

JOLIET Oil Tractor Co., Joliet, Ill. "Bates."

KINNARD-HAINES Co., Minneapolis, Minn.

LAWTER Tractor Co., St. Mary's, O.

LEADER—See Dayton-Dick Co.

LION Tractor Co., Minneapolis, Minn.

LITTLE DEVIL—See Hart-Parr Co.

LITTLE GIANT—See Mayer Bros. Co.

MAYER Bros. Co., 126 W. Rock St., Mankato, Minn. "Little Giant."

MAYTAG Co., Newton, Ia.

MILWAUKEE Locomotive Mfg. Co., Milwaukee, Wis.

MINNEAPOLIS Steel & Machinery Co., 29th St. & Minnehaha Ave., Minneapolis, Minn.

MINNEAPOLIS Threshing Machine Co. (West Minneapolis), Hopkins, Minn.

NATIONAL Pulley & Mfg. Co., 327 S. La Salle St., Chicago, Ill. "Paramount."

NILSON Farm Machine Co., 426 Washington Ave., N., Minneapolis, Minn.

OIL KING—See Hart-Parr Co.

OLD RELIABLE—See Hart-Parr Co.

ORCHARD Machinery Mfg. Co., Gasport, N. Y.

PARAMOUNT—See National Pulley & Mfg. Co.

PARRETT Tractor Co., Fisher Bldg., Chicago, Ill.

PEORIA Tractor Co., Peoria, Ill.

ROBINSON Fire Apparatus Mfg. Co., 4250-68 N. 20th St., St. Louis, Mo.

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MID-YEAR MODEL
73 NEW IDEAS

Mitchell
SIX

$1325 F.O.B. RACINE
26 EXTRA FEATURES

The Solid Mitchell

You wise men of Motordom should ponder well the facts about the Mitchell. Whatever you find here is at least substantial. And to some of you it offers, perhaps, a chance for a great alliance.

82-Year History

Behind this concern lies a record of 82 years of fair dealing. And 82 years of experience.

We started motor car building 13 years ago in this concern's 70th year. So we naturally watched our foundations.

We Have John W. Bate

We have in the Mitchell—and have had for years—a great efficiency engineer. He has stood for right factory methods, and for a right car.

Because of John W. Bate, the Mitchell today stands far in advance of other cars in its class. No other like car, in itself or its factory, so typifies efficiency.

Our Model Plant

The Mitchell plant, covering 45 acres, has been built and equipped by Mr. Bate. Every building, every machine is designed for economical production.

This plant represents an investment of $5,000,000. We maintain in this plant a constant over-capacity. In the past 12 months the demand for Mitchells has trebled. Yet we are not behind orders. We can meet the demand when it doubles again without adding another machine.

30 Million Salesmen

We send out every month, in the Mitchell ads, more than 30 million salesmen to call on possible buyers. Our advertising for this season will cost $500,000. And this will be a permanent policy.

This places the Mitchell among the three or four biggest advertised cars in America.

All the New Ideas

Our Mid-Year model, which came out April 15, embodies all the best ideas in design and equipment exhibited at the New York Shows. We held its completion to include in one car every Show attraction. It brings out 73 new features.

It contains 26 extra features—things other cars omit. Things like a power tire pump, reversible searchlights, light in the tonneau, gasoline primer on dashboard. Each is a wanted feature. We pay for these extras through factory savings.

Every man who investigates is bound to respect the Mitchell. We want to hear from dealers who deserve such a car in territories still open.

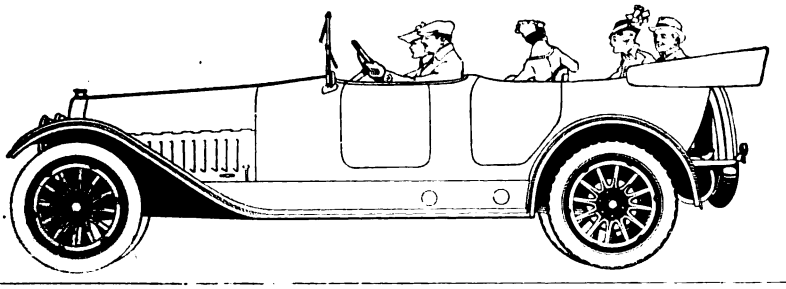
MITCHELL-LEWIS MOTOR CO.
Racine, Wis. U. S. A.

$1325 F. O. B. RACINE

For 5-Passenger Touring Car or 3-Passenger Roadster

7-Passenger Touring Body $35 Extra

High-speed, economical Six. 48 horse-power; 127-inch wheelbase; complete equipment, including 26 extra features.



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COMMERCIAL VEHICLES (Continued)

GASOLINE TRACTORS (Continued)

ROCK Island Plow Co., Rock Island, Ill.

RUMELY Tractor Co., Leo, La Porte, Ind.

RUSSELL & Co., Massillon, O.

ST. PAUL Machinery Mfg. Co., 218 Como Ave., St. Paul, Minn.

SIMPLEX Tractor Co., 1616 Central Ave., Minneapolis, Minn.

STANDARD-DETROIT Tractor Co., 1506 Foot St., Detroit, Mich.

STEEL KING—See Hart-Parr Co.

STEEL King Tractor Co., Detroit, Mich.

SWEENEY Tractor Co., 16th & Liberty Sts., Kansas City, Mo.

WAITE Tractor Sales Co., Karpen Bldg., Chicago, Ill.

WALLIS—See Case T. M. Co.

WATERLOO Gasoline Engine Co., Waterloo, Ia.

WEBER Engine Co., Kansas City, Mo.

WILLMAR Tractor & Mfg. Co., Willmar, Minn.

YUBA Construction Co., Marysville Cal.

TRAILERS

AUTOMOBILE AND TRUCK TRAILERS

AMERICAN Carriage Co., Kalamazoo, Mich.

AUTO Specialty Mfg. Co., 1207-15 G Ave., E., Cedar Rapids, Ia. "Lincoln." (See page 599.)

BETTENDORF Trailer Co., Bettendorf, Ia.

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CAMP-MOBILE—See Cozy Camp & Auto Trailer Co.

COLUMBIA Motor Truck & Trailer Co., Pontiac, Mich.

COLUMBIA Wagon Co., Columbia, Pa.

COMMERCIAL Sales Co., Plymouth Bldg., Minneapolis, Minn.

COZY Camp & Auto Trailer Co., Hume-Mansur Bldg., Indianapolis, Ind. "Camp-Mobile."

CURTIS Trailer Co., 1411 Hennepin St., Minneapolis, Minn.

DEFIANCE Carriage Co., Defiance, O.

DELKER Co., George, Henderson, Ky.

DETROIT Trailer Co., 671 Atwater St., E., Detroit, Mich. (See page 539.)

DUNKLEY Co., Kalamazoo, Mich.

E-B—See Emerson-Brantingham Implement Co.

EMERSON-BRANTINGHAM Implement Co., Rockford, Ill. "E-B."

ERIE Trailer Mfg. Co., Erie, Pa. (See pages 64 and 65.)

FRAZIER & Co., W. S., Aurora, Ill.

HARPER Buggy Co., Columbia City, Ind.

HOPP Carriage Co., Mifflinburg, Pa.

JACKSON—See Miles Mfg. Co.

LAURA, John P., 40 S. Manro St., Coldwater, Mich.

LINCOLN—See Auto Specialty Mfg. Co.

LION Buggy Co., Dept. T. D., Cincinnati, O. (See page 219.)

LITEHAUL—See Puffer-Hubbard Mfg. Co.

LOS ANGELES Trailer Co., 17th & Main Sts., Los Angeles, Cal.

LOWELL Cutter Co., Lowell, Mich.

MARTIN Carriage Works, York, Pa. (See page 587.)

MARTIN Rocking Fifth Wheel Co., 244 Main St., Springfield, Mass.

MATCO—See Michigan Auto Trailer Co.

MAYER Co., 539 Orleans St., Chicago, Ill.

MEEKER Mfg. Co., Linden & Huffman Aves., Dayton, O. "Trail-O-Car."

MIAMI Trailer Co., 406 E. Main St., Troy, O.

MICHIGAN Auto Trailer Co., Detroit, Mich. "Matco." (See page 181.)

MIFFLINBURG Buggy Co., Mifflinburg, Pa. (See page 587.)

MILES Mfg. Co., 302 E. Franklin St., Jackson, Mich. "Jackson." (See page 221.)

OHIO Trailer Co., 57 Doan Ave., Cleveland, O. (See page 367.)

PAGE Bros. Buggy Co., Marshall, Mich.

PARRY Mfg. Co., 110 Parry Ave., Indianapolis, Ind. (See page 589.)

PRESS' Sons, Jacob, Fulton & Halsted Sts., Chicago, Ill.

PUFFER-HUBBARD Mfg. Co., 26th St. & 32d Ave., S., Minneapolis, Minn. "Litehaul."

RANDOLPH, H. C., Jonesville, Mich.

ROGERS Bros. Co., Albion, Pa. (See page 61.)

SECHLER & Co., 663 E. Fifth St., Cincinnati, O. "Trailmobile." (See page 541.)

SHADBOLT Mfg. Co., Flushing Ave. & Cumberland St., Brooklyn, N. Y.

SHATTUCK Trailer Co., Palace Bldg., Minneapolis, Minn.

SIMPLEX Short-Turn Trailer Co., Union Bldg., Anderson, Ind.

STUNKARD Bros. Buggy Co., 24-26 N. Meridian St., Brazil, Ind.

TRAIL-O-CAR—See Meeker Mfg. Co.

TRAILMOBILE—See Sechler & Co.

TROY Wagon Works Co., Troy, O

UNIVERSAL Trailer Co., 1118-20 S. Michigan Ave., Chicago, Ill.

VARIETY Mfg. Co., 340-52 N. Sacramento Bldg., Chicago, Ill.

WARNER Mfg. Co., Beloit, Wis.

MOTOR CYCLES.

MIAMI Cycle & Mfg. Co., Middletown, O. (See page 355.)

MILITAIRE Autocycle Co., Buffalo, N. Y.

Complete Index to Classification appears on Pages 8 to 27.

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Accessories, Parts, Materials and Supplies

PART II

Parts and

Classified lists of the Manufacturers of Component Parts, Accessories, Materials and Supplies

A complete index to classifications appears on pages 8 to 27

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SILENCE

SPEED

"NORMA"

BALL BEARINGS

(Patented)

Remember this: car performance is a combination of a number of separate unit performances in the car equipment. For instance, the engine performance is determined largely by the magneto performance. Whether you get satisfaction, or dissatisfaction, from your lighting and starting system depends upon the performance of your generator and starting motor. And not one of these accessories is better than the poorest part in it.

The makers of practically all the cars of the better class have safeguarded their customers against trouble due to bearing failures in the electrical accessories by adopting magnetos, lighting generators and starting motors in which "NORMA" Bearings are standard.

Are You "NORMA" Wise?

THE NORMA COMPANY OF AMERICA

1790 BROADWAY NEW YORK

Ball, Roller, Thrust, Combination Bearings

PRECISION

SERVICE

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Part II

PARTS AND ACCESSORIES

ACID

BATTERY ACID

(See Electrolyte, Battery)

SOLDERING ACID

(See Flux, Soldering)

ADAPTERS

ELECTRIC LAMP ADAPTERS

(For converting gas or oil lamps into electric lamps)

CHICAGO Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

FAW, J. H., 41 Warren St., New York, N. Y. "Fawsco."
(See page 845.)

FAWSCO—See Faw, J. H.

GENERAL Electric Co., Schenectady, N. Y.

GIL-BO—See Metal Specialties Mfg. Co.

GRAY & Davis, Boston, Mass.
(Seepages 483 to 486.)

HAMMER Co., E. A., 1839 Euclid Ave., Cleveland, O.

HANDY—See Chicago Electric Mfg. Co.

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Gil-Bo."
(See page 257.)

MORSE, Frank W., 293 Congress St., Boston, Mass.
(See page 517.)

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

S-H.—See Stuart-Howland Co.

STUART-HOWLAND Co., 131-41 Federal St., Boston, Mass "S-H."

ALARMS

BOILER ALARMS

(See Columns, Water)

TIRE ALARMS

(For sounding an alarm when tires are under or over inflated)

AIRLO Mfg. Co., 5318 Blackstone Ave., Chicago, Ill.

GEM—See Safety Tire Signal Co.

SAFETY Tire Signal Co., 655 12th St., Boulder, Colo. "Gem."

TERPENING, E. A., Mokena, Ill.

ALCOHOL

DENATURED ALCOHOL

JEFFERSON Distilling & Denaturing Co., New Orleans, La. "Radico."

PETROLEUM Products Co., 39th St. & B. & O. R. R., Pittsburgh, Pa.

PYRO—See United States Industrial Alcohol Co.

RADICO—See Jefferson Distilling & Denaturing Co.

UNITED States Industrial Alcohol Co., 27 William St., New York, N. Y. "Pyro."

WOOLNER Distilling Co., ft. Spillman St., Peoria, Ill.

ALUMINUM

SHEET AND ROD ALUMINUM

(For Aluminum Castings—See Castings, Aluminum)
(For Aluminum Tubing—See Tubing, Aluminum)

ALUMINUM Co. of America, Pittsburg, Pa.
(See page 479.)

Complete Index to Classification appears on Pages 8 to 27.

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AMMETERS

STANDARD AMMETERS AND VOLTMETERS

(For switchboard and electric vehicle use. For Pocket Meters—See Gauges, Battery)

CLARK Electric Meter Co., 1330 12th St., Detroit, Mich. (See page 663.)

GENERAL Electric Co., Schenectady, N. Y.

HOYT Electrical Instrument Works, Penacook, N. H. (See page 623.)

JEWELL Electrical Instrument Co., 810 W. Lake St., Chicago, Ill.

KEYSTONE Electrical Instrument Co., Wayne & Windrim Aves., Philadelphia, Pa.

NORTON Electrical Instrument Co., Manchester, Conn.

PIGNOLET, Louis M., 78 Cortlandt St., New York, N. Y.

QUEEN-GRAY Co., 616-18 Chestnut St., Philadelphia, Pa.

RELIANCE Instrument Co., 1135 Van Buren St., Chicago, Ill.

ROLLER-SMITH Co., 233 Broadway, New York, N. Y.

WAGNER Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WESTON Electrical Instrument Co., 16 Weston Ave., Newark, N. J. (See page 707.)

ANNUNCIATORS

AUTOMOBILE ANNUNCIATORS

(For signaling from passenger to driver. For Speaking Tubes—See Tubes, Speaking. For Limousine Telephones—See Telephones, Limousine)

HOLT & Beebee Co., 51 Chardon St., Boston, Mass.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

ANTI-RATTLERS

DOOR ANTI-RATTLERS

BAILEY Co., Wm. J., 401-07 Mulberry St., Newark, N. J. "C. B."

C. B.—See Bailey Co.

DOW Co., Clarence W., 215 Gladstone Ave., Detroit, Mich.

FERNALD Mfg. Co., North East, Pa. (See page 863.)

MITCHELL Specialty Co., 2009 Market St., Philadelphia, Pa.

N. E. Auto Door Bumper Co., Rindge Ave. (N. Cambridge), Cambridge, Mass.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

ASBESTOS

SHEET ASBESTOS

(For Asbestos Packing—See Packing, Asbestos)

AMBESCO—See American Asbestos Co.

AMERICAN Asbestos Co., Norristown, Pa. "Ambesco." (See page 619.)

J-M—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M."

KEASBEY & Mattison Co., Ambler, Pa.

NATIONAL Asbestos Co., 5522 Lena St. (Germantown), Philadelphia, Pa.

NORRISTOWN Magnesia & Asbestos Co., Norristown, Pa.

WATSON Co., H. F., Erie, Pa.

ATTORNEYS

PATENT ATTORNEYS

GANNETT, Malcolm F., 1212 C St., N. E., Washington, D. C. (See page 859.)

AXLES

FRONT AXLES

AMERICAN Ball-Bearing Co., Cleveland, O. (See page 73.)

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

COLUMBIA Axle Co., Cleveland, O. (See page 71.)

DETROIT Axle Co., Detroit, Mich. (See page 187.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa. (See page 363.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GILL & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y. (See page 669.)

GREENVILLE Steel Car Co., Greenville, Pa.

HESS—See Western Spring & Axle Co.

HESS Spring & Axle Co., 124 W. 66th St., Cincinnati, O.

HIGGINS Spring & Axle Co., Racine, Wis. (See page 847.)

JACOBSON Machine Mfg. Co., Warren, Pa. (See page 851.)

LADISH - OBENBERGER Co., Cudahy, Wis. (See page 799.)

LIGGETT Spring & Axle Co., Monongahela, Pa.

MOTT Wheel Works, Utica, N. Y. (See page 497.)

PERU Auto Parts Mfg. Co., Peru, Ind. (See page 781.)

Complete Index to Classification appears on Pages 8 to 27.

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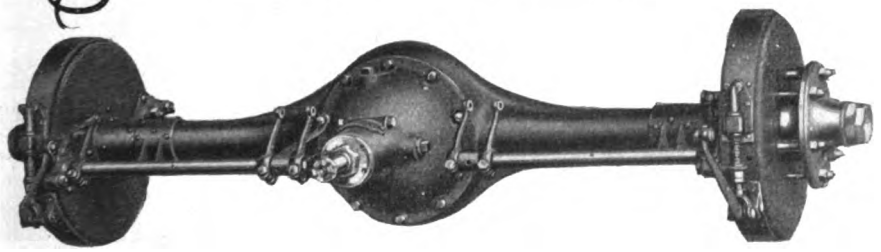
FREEDOM

It is the firm purpose and resolve of each workman in our organization that Columbia Axles shall go into use free from error or defect in construction.

It is this spirit expressed in the terms of service given by Columbia Axles that contributes so largely to the enjoyment and pride of owners in whose cars Columbia Axles are incorporated.

Freedom from racking axle noises; freedom from danger of breakage; freedom from the annoyance of frequent adjustments; all serve to enhance greatly the enjoyment of motoring and motor car ownership.



REAR AXLES—Three-quarter floating type. Pressed steel housings, reinforced by seamless drawn steel tubes, assure maximum strength and rigidity with light weight. The whole weight is carried on the housings, none on the driving shaft.
BRAKES—Internal and external wrapping type. Unusually large and efficient. Carefully tested and adjusted.
BEARINGS—Taper Roller Bearings are used throughout in both front and rear Columbia Axles. Two bearings in each wheel.
GEARS—Spiral Bevel Gears assure the utmost quietness and smoothness of operation.
FRONT AXLE—I-Beam Forging, heat treated. Ball thrust bearings in the yoke provide extraordinary ease of steering.

Estimates promptly furnished on request.

The Columbia Axle Co.
CLEVELAND, O.

COLUMBIA AXLES

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AXLES (Continued)

FRONT AXLES (Continued)

ROCKFORD Machine Co., Rockford, Ill.
(See pages 300 and 301.)

RUSSEL Motor Axle Co., North Detroit, Mich.
(See page 778.)

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

SHELDON Axle & Spring Co., Wilkes-Barre, Pa.
(See pages 33 to 40.)

SHULER Axle Mfg. Co., Detroit, Mich.
(See page 813.)

TIMKEN-DETROIT Axle Co., Detroit, Mich.

WALKER-WEISS Axle Co., St. John St. & Hamilton Ave., Flint, Mich.

WESTERN Spring & Axle Co., (Carthage), Cincinnati, O. "Hess."
(See page 304.)

WESTON-MOTT Co., Flint, Mich.
(See page 463.)

REAR AXLES

ADCO—See American Die & Tool Co.

AMERICAN Ball-Bearing Co., Cleveland, O.
(See page 73.)

AMERICAN Die & Tool Co., Reading, Pa. "Adco."
(See page 673.)

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CELFOR Tool Co., Buchanan, Mich.

COLUMBIA Axle Co., Cleveland, O.
(See page 71.)

DETROIT Axle Co., Detroit, Mich.
(See page 137.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

EMPIRE Axle Co., Dunkirk, N. Y.
(See page 665.)

HESS—See Western Spring & Axle Co.

HESS Spring & Axle Co., 124 W. 66th St., Cincinnati, O.

HINDLEY Gear Co., 1105 Frankford Ave., Philadelphia, Pa.

JACOBSON Machine Mfg. Co., Warren, Pa.
(See page 851.)

KEYSTONE-HINDLEY Gear Co., Pennsylvania Bldg., Philadelphia, Pa.

LIGGETT Spring & Axle Co., Monongahela, Pa.

MOTT Wheel Works, Utica, N. Y.
(See page 497.)

OTIS Elevator Co., 11th Ave. & 26th St., New York, N. Y.

PERU Auto Parts Mfg. Co., Peru, Ind.
(See page 781.)

ROCKFORD Machine Co., Rockford, Ill.
(See pages 300 and 301.)

RUSSEL Motor Axle Co., North Detroit, Mich.
(See page 778.)

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

SHELDON Axle & Spring Co., Wilkes-Barre, Pa.
(See pages 33 to 40.)

TIMKEN-DETROIT Axle Co., Detroit, Mich.

TORBENSON Gear & Axle Co., E. 72d St. & L. S. & M. S. R. R., Cleveland, O.

WESTERN Spring & Axle Co., (Carthage), Cincinnati, O. "Hess."
(See page 304.)

WESTON-MOTT Co., Flint, Mich.
(See page 463.)

REAR AXLES WITH TRANSMISSION

ADCO—See American Die & Tool Co.

AMERICAN Die & Tool Co., Reading, Pa., "Adco."
(See page 673.)

LINDSAY Auto Parts Co., Fletcher Savings & Trust Bldg., Indianapolis, Ind.

RUSSEL Motor Axle Co., North Detroit, Mich.
(See page 778.)

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

SPECIAL TRAILER AXLES

AMERICAN Axle Co., 12th St. & Montgomery Ave., Philadelphia, Pa.

ILLINOIS Iron & Bolt Co., Carpentersville, Ill.

BACKS

METAL SEAT BACKS

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

AMERICAN Auto Top Mfg. Co., 1451-53 Washington Blvd., Chicago, Ill.

CORNWALL Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.
(See page 739.)

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D, Cincinnati, O. "Lawco."
(See page 617.)

MULLINS Co., W. H., 182 Franklin St Salem, O.

BAGS

COAT RAIL BAGS

AJAX Trunk & Sample Case Co., 144-50 W. 18th St., New York, N. Y.

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

Complete Index to Classification appears on Pages 8 to 27.

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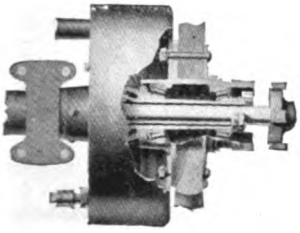
Several Features of Superiority

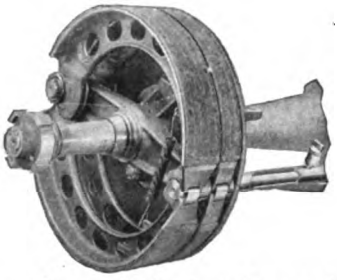
found only in the Full-Floating

American Axles

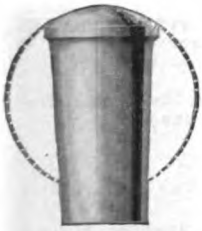
Equipped with Spiral Bevel Gears and Bock Taper Roller Bearings



Removable Axle Shafts drive the wheels. One-piece nickel steel Axle Tubes support *entire* weight of car. Hub is of *steel;* Driving Clutch is quickly removable and of *nickel steel.*

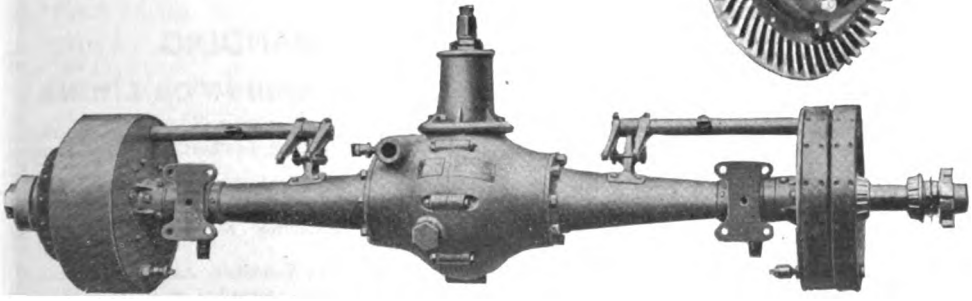


The Twin Internal Brakes do not grab, but exert a brake action always in direct ratio to effort exerted by driver.



Two Bock taper roller bearings in each hub take end thrust like ball thrust bearings, and without the slippage, friction or jamming, so destructive to other taper roller bearing assemblies.

The Spider carrying small differential pinions is free to float—equalizing all strains in the differential.



Licensed under The Kardo Company Patents

THE AMERICAN BALL-BEARING COMPANY

Pioneer Axle Builders of America **CLEVELAND, OHIO**

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BAGS (Continued)

COAT RAIL BAGS (Continued)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

WINSHIP, W. W., 71 Summer St., Boston, Mass.

RUBBER GAS BAGS

DAVOL Rubber Co., Providence, R. I.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind. (See page 523.)

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

SEAMLESS Rubber Co., 534 Congress Ave., New Haven, Conn.

TYER Rubber Co., Andover, Mass. "Tyrian."

TYRIAN—See Tyer Rubber Co.

WATER CARRYING BAGS

EGYPTIAN—See Whitaker Mfg. Co.

WHITAKER Mfg. Co., Chicago, Ill. "Egyptian." (See page 765.)

TOOL BAGS OR ROLLS

(For Tool Boxes—See Boxes, Tool)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. (See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y. (See page 205.)

BOYLE & Co., John, 112-14 Duane St., New York, N. Y.

CAMPBELL—See Perkins Campbell Co.

COOK & Bro., E. C., 1801-45 Carroll Ave., Chicago, Ill.

DAFOE-EUSTICE Co., Jefferson Ave. & Antoine St., Detroit, Mich. "Duk-Bak."

DUK-BAK—See Dafoe-Eustice Co.

ECONOMY Stay Co., Jefferson City, Mo.

ERO Mfg Co., 408-16 W. Grand Ave., Chicago, Ill.

EXCELSIOR Bag & Mfg. Co., Troy, N. Y.

FEESER Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

GOSS Co., J. C., 16 Woodbridge St., E., Detroit, Mich.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

MAU-SHERWOOD Supply Co., 1616 W. Third St., Cleveland, O.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 207.)

PLANET Co., 180 N. Elm St., Westfield, Mass.

PREMIER Auto Novelty Mfg. Co., 875 W. Broadway, New York, N. Y.

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

SUPERIOR—See Feeser Co.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O. (See page 211.)

BALLS

STEEL BALLS

ABBOTT Ball Co., Railroad St., Elmwood, Conn.

ATLAS Ball Co., Glenwood Ave. & Second St., Philadelphia, Pa.

AUBURN Ball Bearing Co., 27 Elizabeth St., Rochester, N. Y. (See page 111.)

BEARINGS Co. of America, 250 W. 54th St., New York, N. Y. (Importers.) (See page 115.)

BISMARCK—See Frasse & Co.

D. W. F.—See Frasse & Co.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (Importers.) "D. W. F.," "Bismarck." (See page 491.)

GWILLIAM Co., 253 W. 58th St., New York, N. Y. (Distributors.) (See page 679.)

HOFFMAN—See R. I. V. Co.

HOOVER Steel Ball Co., Ann Arbor, Mich. (See page 491.)

JONES Ball Co., Arlington Heights, Mass.

NEW Departure Mfg. Co., Bristol, Conn. (See page 101.)

R. I. V. Co., 254 W. 57th St., New York, N. Y. (Importers.) "Hoffman."

STANDARD Roller Bearing Co., 50th St. & Lancaster Ave., Philadelphia, Pa.

BANDING

BRAKE BANDING OR LINING

(For lining brakes or clutches—See also Leather, Friction; also Belting, Leather; also Fibre, Hard)

ADVANCE Packing & Supply Co., 11 N. Franklin St., Chicago, Ill. "Brakebestos."

AJAX—See Asbestos & Rubber Works of America.

AMBESCO—See American Asbestos Co.

AMBLER AUTOBESTOS—See Keasbey & Mattison Co.

AMERICAN Asbestos Co., Norristown, Pa. "Ambesco." (See page 619.)

ARABIAN—See Rossendale-Reddaway Belting & Hose Co.

ARNO—See Cincinnati Rubber Mfg. Co.

Complete Index to Classification appears on Pages 8 to 27.

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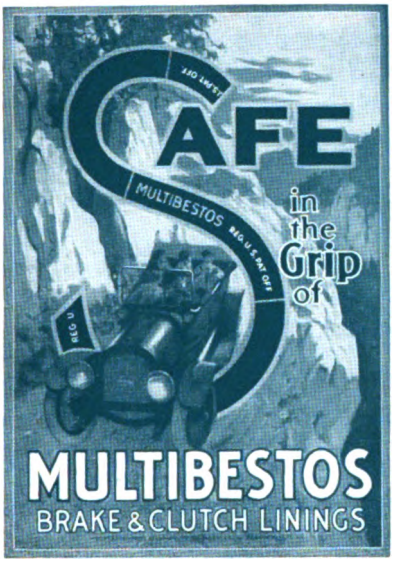

MORE and more motorists are giving notice to the question of brake lining.

To them, the factor of safety is most important, and they demand only those accessories and parts that are reliable and dependable in emergency.

They are beginning to realize that oftentimes a sure, certain stop is more important than a quick, easy start.

So it is only natural that a steadily growing preference for **Multibestos** should exist. Here is a brake lining that admits no comparison with any other in point of braking ability, durability and heat resistance. Its superiority is proved by numerous engineering and road tests.

Its high reputation is established by the fact that it is used as standard equipment on a majority of the best cars built in America.

It is truly the brake lining of quality.

STANDARD WOVEN FABRIC CO.

Walpole, Mass.

New York Branch and Export Offices: 1779 Broadway

BOSTON, MASS., 175 Massachusetts Ave.
CHICAGO, ILL., 1432 Michigan Blvd.
PHILADELPHIA, PA., 1309 Race St
ATLANTA, GA., 6 West Harris St.
SAN FRANCISCO, CAL., First and Howard Sts.

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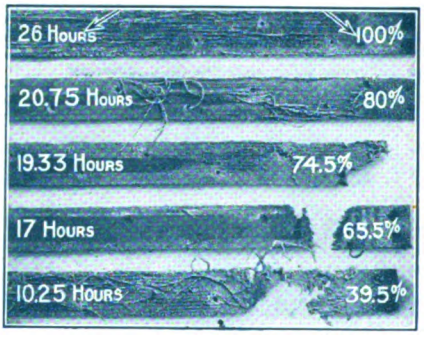
MULTIBESTOS



PROVED BY COMPETITIVE TESTS

This illustration shows Multibestos and four other well-known brake **linings after a series of tests conducted** by Prof. David L. Gallup of the Worcester **Polytechnic Institute and Chairman of the** Research Committee of the Society of Automobile **Engineers.**

The photograph itself is eloquent—but we would also like you to hear **what Prof. Gallup has to say:**

> "After a careful examination of the brake linings upon the completion of these tests, and an analysis of the results obtained, it is evident that Multibestos stands superior to other brake linings tested with particular reference to the following points: Braking ability under all conditions of service; Durability and Resistance to effect from heat."

As a result of many other just such tests, Multibestos has been adopted **and is being used as standard equipment** on the Packard, Pierce-Arrow, Locomobile, **Crane-Simplex, Studebaker—in fact on a majority** of the best cars built in America.

Its great efficiency and wearing qualities are due to a close, firm **weave of pure, long-fiber asbestos with** a brass wire insertion.

MULTIBESTOS MULTIBESTOS PRICE LIST

(Per Running Foot)

Thickness	Widths														
	1″	1¼″	1½″	1¾″	2″	2¼″	2½″	2¾″	3″	3½″	4″	4½″	5″	5½″	6″
1/8″	.33	.38	.42	.48	.54	.61	.67	.73	.77	.84	.96	1.08	1.20	1.32	1.44
3/16″	.38	.46	.51	.59	.67	.75	.84	.92	1.00	1.10	1.20	1.36	1.50	1.68	1.80
3/16″	.44	.52	.60	.71	.79	.88	.98	1.07	1.17	1.26	1.44	1.62	1.81	1.99	2.17
1/4″	.58	.69	.79	.92	1.05	1.17	1.30	1.41	1.53	1.68	1.92	2.16	2.40	2.64	2.88
3/16″	.70	.85	1.00	1.15	1.30	1.45	1.60	1.75	1.80	2.10	2.40	2.70	3.00	3.30	3.60

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THIS CABINET MAKES MULTIBESTOS EASIER TO SELL

Just another feature of Multibestos Trade Service—the key-note of which is Sales-Helpfulness. It is for the use of the jobber and large dealer who finds it necessary to carry a considerable stock of brake lining in different sizes. The Multibestos cabinet is furnished complete—without extra cost—with stock orders.

It is built in sections, each with a 700-ft. capacity. There's a separate compartment for each size. Each roll revolves on an axis. You can have yours stained to match the woodwork in your store.

By the use of this cabinet, the right size of the right brake lining is always at hand—ready to measure and cut on a few seconds notice by aid of the "white foot prints." These "foot prints" are plain white lines running across the surface of the fabric at intervals of exactly one foot.

The following lists of sizes are given for your guidance in placing stock orders. They are merely suggestions and it may be that there are other sizes you should have. For the most part, however, these lists cover nearly all of the more popular sizes that are in everyday demand. And when you stock Multibestos we are always glad to have the slow-moving sizes returned and to replace them for those in more brisk demand.

700 FEET		1000 FEET		1200 FEET	
50	1⅛x 1/16	100	1⅛x 1/16	100	1⅛x 1/16
50	1¼x 1/16	100	1¼x 1/16	100	1¼x 1/16
100	1½x 1/16	100	1½x 1/16	100	1½x 1/16
100	1¾x 1/16	100	1¾x 1/16	100	1¾x 1/16
100	2 x 1/16	200	2 x 1/16	200	2 x 1/16
50	2¼x 1/16	100	2¼x 1/16	100	2¼x 1/16
50	2½x 1/16	100	2½x 1/16	100	2½x 1/16
50	2¾x 1/16	50	2¾x 1/16	100	2¾x 1/16
50	3 x 1/16	50	3 x 1/16	100	3 x 1/16
50	2 x¼	50	2 x¼	100	2 x¼
50	2½x¼	50	2½x¼	100	2½x¼
700		1000		1200	

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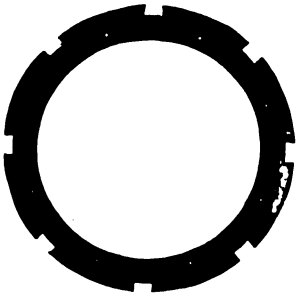
Clutch Facings

Multibestos Clutch Facings are made in any size or shape to conform to any type of clutch.



Multiple disc clutch rings up to 30″ diameter can be made endless or with our special invisible joint.

All Multibestos facings whether for disc or cone clutches are exact in dimensions and perfect in form. They lie flat on the plate and will not swell or stick under any conditions of service. A special treatment makes them withstand the effects of oil and a special weaving process gives them a smooth, even friction surface.

Prices will be given gladly on Multibestos Facings for any clutch. Give large diameter, width and thickness of lining for disc facings; give diameter and pitch of clutch for cone facings.

We are also equipped with riveting machinery and other facilities for attaching the facings.

Multibestos Special Brake Lining

for Ford Cars is similar in weave and appearance to our regular Multibestos, but unlike the regular brake lining, it has no brass wire insertion.

It is made only of the purest of long fibre asbestos so that it will withstand the effects of heat and be durable under any conditions of service. This special grade of Multibestos is treated by a special compound which is not affected in the least by oil.

Furnished in rolls or in sets—each set containing three pieces 23½″ long with the necessary rivets for attaching to the bands.

Multibestos Tire Tape is a product of our rubber department and is used extensively in the automobile trade. It is made of strong cotton cloth, thoroughly impregnated with a rubber compound. This compound makes the tape proof against air-drying so that it will not unwrap when used for outside work. In fact it is proof against atmospheric conditions and always retains its high adhesive quality.

The Multibestos Brake Lining Cutter fills a long-felt want in the trade and is one of the greatest time-saving tools ever offered. Besides cutting brake lining easily, it can also be used for cutting cable, wire or light metal.

This cutter is made exclusively for the Standard Woven Fabric Co. and is sold by all Multibestos distributors. It lists at $1.50.

STANDARD WOVEN FABRIC CO.
Walpole, Mass.
New York Branch and Export Offices: 1779 Broadway

BOSTON, MASS. 175 Massachusetts Ave.
PHILADELPHIA, PA. 1309 Race St.
CHICAGO, ILL. 1432 Michigan Blvd.
ATLANTA, GA. 6 West Harris St.
SAN FRANCISCO, CAL. First and Howard Sts.

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Asbestos and Rubber Works of America

Motobestos—Solid Woven Brake Lining

BRAKE LININGS

Which are water-, oil-, grease-, heat-, and mud-proof—which will never get hard or squeak and which grip easily and quickly and hold firmly are known to the trade as "Motobestos" and "Ajax."

These linings are constructed of pure asbestos cloth in which each thread has a brass wire center, giving strength, flexibility and long wearing properties.

		Thickness			
Width	*Price Per Ft.*	⅛	5/32	3/16	¼
1	"	.40	.45	.50	.70
1¼	"	.50	.55	.60	.80
1½	"	.60	.65	.70	.90
1¾	"	.70	.75	.80	1.00
2	"	.80	.85	.90	1.20
2¼	"	.90	.95	1.00	1.30
2½	"	1.00	1.05	1.10	1.50
3	"	1.20	1.25	1.30	1.70
4	"	1.40	1.55	1.70	2.20

A coating of specially prepared rubber compound is applied so that the material is thoroughly impregnated and is rendered proof against absorption deterioration.

Send for our confidential dealers' discount on Brake Linings, Clutch Facings, Packing, Tubing, Anti-Squeak Radiator Hose, and Gaskets for all purposes.

Ajax Hydraulic Compressed Brake Lining

1790 Broadway, New York

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BANDING (Continued)

BRAKE BANDING OR LINING (Continued)

ASBESTOS & Rubber Works of America, 1790 Broadway, New York, N. Y. "Motobestos," "Ajax." (See page 79.)

ASBESTOS & Rubber Works of New Jersey, Camden, N. J. "Longwear." (See page opp. Inside Back Cover.)

AXWELL Equipment Co., Ferguson Bldg., Pittsburgh, Pa.

BESTBESTOS—See Federal Asbestos Co.

BLUE EDGE—See Woven Steel Hose & Rubber Co.

BRAKEBESTOS—See Advance Packing & Supply Co.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

CAMEL HAIR — See Rossendale - Reddaway Belting & Hose Co.

CAREY Co., Philip (Lockland), Cincinnati, O. "Enduro."

CINCINNATI Rubber Mfg. Co., Cincinnati, O. "Arno." (See page 763.)

CORK Insert Co., 164 Federal St., Boston, Mass.

DIAMOND N—See Norristown Magnesia & Asbestos Co.

EDKIN—See Germann Bronze Co.

ELEKTRA—See Horton Mfg. Co.

EMBESTOS—See Empire Rubber & Tire Co.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J. "Embestos."

ENDURO—See Carey Co.

ESSEX Rubber Co., Trenton, N. J.

FEDERAL Asbestos Co., Van Houten St., Paterson, N. J. "Bestbestos." (See pages 300 and 301.)

GANDY Belting Co., 728 W. Pratt St., Baltimore, Md.

GARCO—See General Asbestos & Rubber Co.

GENERAL Asbestos & Rubber Co., Charleston, S. C. "Garco." (See page 81.)

GERMANN Bronze Co., 355 W. 19th St., Erie, Pa. "Edkin."

GRIP-ON—See New York Leather Belting Co.

HORTON Mfg. Co., F. L., 36 Whittier St., Roxbury, Mass. "Elektra." (See page 727.)

J-M NON-BURN—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M Non-Burn."

KEASBEY & Mattison Co., Ambler, Pa. "Ambler Autobestos."

LONGWEAR—See Asbestos & Rubber Works of New Jersey.

MAU-SHERWOOD Supply Co., 1616 W. Third St., Cleveland, O.

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill.

MOTOBESTOS—See Asbestos & Rubber Works of America.

MULTIBESTOS—See Standard Woven Fabric Co.

NEW YORK Leather Belting Co., 465 Kent Ave., Brooklyn, N. Y. "Grip-on."

NORRISTOWN Magnesia & Asbestos Co., Norristown, Pa. "Diamond N."

RAYBESTOS—See Royal Equipment Co.

ROSSENDALE-REDDAWAY Belting & Hose Co., Euclid Ave., Newark, N. J. "Camel Hair," "Arabian."

ROYAL Equipment Co., Bridgeport, Conn. "Raybestos," "Stability." (See page 123.)

RUSCO—See Russell Mfg. Co.

RUSSELL Mfg. Co., Middletown, Conn. "Rusco." (See page 811.)

S-M-C—See Staybestos Mfg. Co.

SCANDINAVIA Belting Co., 106 Reade St., New York, N. Y.

STABILITY—See Royal Equipment Co.

STANDARD Brake Lining Co., Gleasondale, Mass.

STANDARD Woven Fabric Co., Walpole, Mass. "Multibestos." (See pages 75 to 78.)

STAYBESTOS Mfg. Co., 5534 Lena St., (Germantown), Philadelphia, Pa. "S-M-C," "Universal." (See page 581.)

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

UNIVERSAL—See Staybestos Mfg. Co.

VULTITE Rubber Co., Bridgeport, Conn. (See page 797.)

WOVEN Steel Hose & Rubber Co., Trenton, N. J. "Blue Edge." (See page 829.)

BANDS

NON-SKID BANDS

(See also Treads. Detachable. For Tire Chains—See Chains, Tire)

BUKOLT Mfg. Co., Stevens Point, Wis. "Highway."

HIGHWAY—See Bukolt Mfg. Co.

LEATHER Tire Goods Co., Niagara Falls, N. Y. "Woodworth." (See pages 82 and 83.)

PERFECTION Non-Skid Climber Co., Edon, O.

WOODWORTH—See Leather Tire Goods Co

BAROMETERS

ALTITUDE INDICATING BAROMETERS

(For Dash Attachment).

BERNARD, F. J., 70 Murray St., New York, N. Y.

BARS

ARCH BARS

(See Supports, Hood)

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Brake Lining must be PERFECT

GARCO RESISTS WEAR

Solidly woven from high grade long-fibre asbestos and strongly re-enforced by inter-woven brass wires, GARCO asbestos Brake Lining provides a perfect braking surface down to the last fraction of an inch.

GARCO will not heat or burn. It is impregnated with a secret solution that protects it perfectly from the action of oil, water, grease or dirt. It may be drilled and countersunk—*holds the rivets.*

GARCO is sold through your jobber, but full information and details of our interesting dealers' proposition will be gladly sent on request.

TRADE GARCO MARK

GENERAL ASBESTOS & RUBBER CO.

Main Office and Factories: Charleston, S. C.

Branches: New York, Pittsburgh, San Francisco

We also make a special lining for Ford Transmission bands and complete line of Asbestos Automobile Specialties.

Thermoid

BRAKE LINING

HYDRAULIC COMPRESSED

BRAKE LINING 100%

Not affected by heat, oil, water gasoline or dirt. 100% Clear Through.

Ask your Jobber

THERMOID RUBBER CO., Trenton, N. J.

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Woodworth Trouble-Proof Tires

Woodworth Trouble-Proof Tire Casings are very carefully hand made from the best materials obtainable. They are guaranteed against both punctures and blow-outs for 5000 miles and are guaranteed if used on one side of the machine against any other make on the other side, to give further mileage for the money than the other make or a refund will be made.

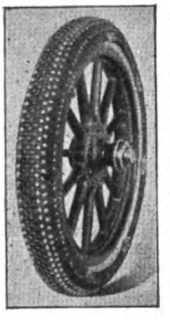
Woodworth Trouble-Proof Tubes are guaranteed against leaks of any kind for one year from date of sale except as the result of punctures or blow-outs.

PRICE LIST OF WOODWORTH TROUBLE-PROOF TIRES AND TUBES

In effect January 1, 1916

Size	TROUBLE-PROOF TIRES Plain Tread Casing	Non-Skid Casing	TROUBLE-PROOF TUBES	Size	TROUBLE-PROOF TIRES Plain Tread Casing	Non-Skid Casing	TROUBLE-PROOF TUBES	Size	TROUBLE-PROOF TIRES Plain Tread Casing	Non-Skid Casing	TROUBLE-PROOF TUBES
28x3	$14.65	$16.50	$3.10	33x4	$32 00	$36 00	$5 30	37x4½	$48.90	$55.00	$7.45
30x3	15.65	17.40	3.20	34x4	33.00	37.20	5.40	38x4½	50.25	56.50	7.60
32x3	16.65	18.25	3.30	35x4	34.00	38.40	5.50	34x5	52.20	58.80	7.70
30x3½	21.00	23.20	3.40	36x4	35.00	39 60	5.60	35x5	53.70	60.40	7.90
31x3½	21.60	24.20	3.45	37x4	36.20	40.80	5.75	36x5	55 30	62.20	8.15
32x3½	22.50	25.20	3.50	32x4½	42.00	47 35	6 50	37x5	56.90	64 00	8.35
34x3½	24.10	26.20	3.70	34x4½	44.80	50.40	6.85	37x5½	66 00	74.00	8.80
31x4	29 84	33 60	5.00	35x4½	46.20	51.95	7 05	38x5½	67 80	76 50	9.00
32x4	30.95	34.80	5.20	36x4½	47.50	53.45	7 25				

Made in clincher, straight side and QD styles.



Woodworth Treads and Overshoes

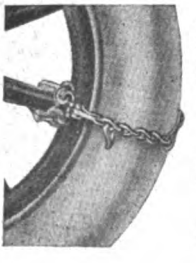
Woodworth Treads and Overshoes are steel-studded leather covers for use over the tires to prevent punctures and skidding and protect the tires from outside injury and wear. Woodworth Treads are held on the tires by rings on each side consisting of coil springs which keep the tread perfectly adjusted. The Overshoes are held on the tires by fastening to the rim. On clincher tires they are held with small hooks which engage the clincher rim and on straight side or QD tires they have a very thin bead which fits between the tire and the rim.

PRICE LIST OF WOODWORTH OVERSHOES AND TREADS

For Automobile Tires

Size	Light Weight	Hard-studded Overshoes or Center-studded Treads	Size	Light Weight	Hard-studded Overshoes or Center-studded Treads	Size	Light Weight	Hard-studded Overshoes or Center-studded Treads	Size	Light Weight	Hard-studded Overshoes or Center-studded Treads
*28x2½	$5.40	$7.50	30x3½	$6.90	$10.75	36x4	$10 70	$17 75	34x5	$13.20	$23.25
*28x2¾	5.50	7.75	31x3½	7.50	11.15	37x4	11.20	18.25	35x5	13.80	24.25
*28x3	5.60	8.00	32x3½	7.80	11 50	40x4	12.90	20 00	36x5	14.40	25.00
*29x2¾	5.65	8.25	34x3½	8.70	12.25	42x4	14.00	21 00	37x5	15.00	26.00
*29x3	5.75	8.50	36x3½	9.60	13.20	32x4½	10.60	19 00	38x5	15.60	26.75
30x3	5.95	9.00	30x4	8.20	14.50	34x4½	11.60	20.50	40x5	16.80	28.50
32x3	6.30	9.60	31x4	8.60	15.00	35x4½	12.10	21.25	36x5½	16.25	27.00
34x3	6.65	10.20	32x4	9.00	15.50	36x4½	12.60	22.00	37x5½	17.00	28.00
36x3	7.00	10.75	33x4	9.40	16.00	37x4½	13.10	23.00	38x5½	17.75	29.00
28x3½	6.60	10.00	34x4	9.70	16.50	38x4½	13.60	24.00	40x5½	19.25	31.00
29x3½	6.75	10.50	35x4	10.20	17.25	42x4½	15 60	26.50	*These sizes fit motor-cycles.		

Side-Studded Overshoes having flat-head rivets on the sides can be furnished for use on rutty roads at an extra cost of 10 per cent for the Hard-studded and 20 per cent for the Light-Weight Styles. In ordering be sure to mention whether for Clincher, Q. D. or Straight-Side tires.



Easyon Tire Chains

are individual chains fastened to the spokes with leather covered fasteners having a snap at each end. The cross chains are of a special design which does not injure the rubber but will take a strong hold in mud and snow. EASYON CHAINS can be applied in a moment even when stuck in the mud. If you carry EASYON CHAINS you do not have to wear out your tires by using chains continuously in wet weather for you can put the chains on easily whenever you find they are needed.

EASYON CHAINS are just the thing for use with non-skid tires to give the extra grip on the road that is necessary on ice or in deep mud and snow.

Packed with a set of 8 in a bag, suitable for carrying in the car: four for each rear wheel, a sufficient number to give perfect traction under any condition.

Size 3½ fits 3 in. or 3½ in. tires. Price 30 cents each..... $2.40 per set
Size 4½ fits 4 in. or 4½ in. tires. Price 40 cents each..... 3.20 per set
Size 5½ fits 5 in. or 5½ in. tires. Price 50 cents each..... 4.00 per set

PRICES OF PARTS

	SIZE 3½	SIZE 4½	SIZE 5½
Cross Chains.....	15 cents each	20 cents each	25 cents each
Leather Fastegers...	15 cents each	20 cents each	25 cents each

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EASYON SOLID TIRE CHAINS

EASYON SOLID TIRE CHAINS have much heavier fasteners for attaching to the spokes. The chains across the tire are composed entirely of heavy, short twisted links. They are made in three sizes:—

Small Size fits single solid tires up to 3 in. Price 40 cents each..... $3.20 per set
Medium Size fits single solid tires larger than 3 in. Price 70 cents each..... 5.60 per set
Large Size fits Dual tires. Price 75 cents each..... 6.00 per set

PRICES OF PARTS

	SMALL SIZE	MEDIUM SIZE	LARGE SIZE
Fasteners	25 cents each	50 cents each	50 cents each
Cross Chains.....	15 cents each	20 cents each	25 cents each

No-Slip, No-Stretch Ford Fan Belt

Fan Belt

No-Slip, No-Stretch Ford Fan Belts are made of a strong inelastic fabric with facing of especially treated leather where it comes next to the pulleys. These Belts will not stretch and will hug the pulleys perfectly. Price 40 cents each.

Similar Belts for any make of car using a flat belt can be furnished at a price of 20 cents per foot for belts no wider than 1¼ in.

Spring Oiler Straps

Spring Oiler Strap

Spring Oiler Straps are straps made of especially prepared leather having a ply of wicking on the inside where they come next to the springs. They have a hole in the top with a leather flap over it through which the oil can be squirted on the wicking. They buckle around the spring just back of the clip which binds the leaves together and keep feeding oil to the sides of the springs where it will work between them when the car is in motion.

These Straps are suitable for all makes of cars. One size will fit all makes of springs, they are unbreakable and can be adjusted quickly and easily. Price 25 cents each.

Woodworth Fabric-Lined Hook-On Boots

are made of chrome leather and a very strong inelastic waterproofed fabric on the inside studded on the middle to protect the leather from wear.

Light Hook-on Boot

PRICE LIST OF FABRIC-LINED HOOK-ON BOOTS

Size	7 IN. LONG Grain Leather Light	7 IN. LONG Split Leather Light	10 IN. LONG Grain Leather Light	10 IN. LONG Split Leather Light	Size	7 IN. LONG Grain Leather Light	7 IN. LONG Split Leather Light	10 IN. LONG Grain Leather Light	10 IN. LONG Split Leather Light
3	$1 10	$0 90	$1.70	$1.25	4½	$1 75	$1.20	$2.60	$1.70
3½	1 30	1 00	1.95	1 40	5	2 00	1.30	3.00	1.85
4	1.50	1 10	2.25	1.55					

Woodworth One-Ply Hook-On Boots

are made of one-ply heavy chrome leather studded on the middle with rivets to protect the leather All types on hook-on Boots are made both for clincher and straight side tires. For straight side tires they have hooks which fasten under the bead of the tire.

PRICE LIST OF ONE-PLY HOOK-ON BOOTS, GRAIN LEATHER

Size	7 IN. LONG Plain	7 IN. LONG Studded	7 IN. LONG Reinforced	10 IN. LONG Plain	10 IN. LONG Studded	10 IN. LONG Reinforced	Size	7 IN. LONG Plain	7 IN. LONG Studded	7 IN. LONG Reinforced	10 IN. LONG Plain	10 IN. LONG Studded	10 IN. LONG Reinforced
3	$0 60	$0 65	$0 95	$0 85	$0 95	$1 35	4½	$0 90	$1 00	$1 50	$1 30	$1 40	$2 10
3½	70	75	1 10	1.00	1 10	1 50	5	1.00	1 10	1.70	1.40	1.55	2.40
4	80	90	1 25	1 15	1 25	1 75							

PRICE LIST OF ONE-PLY HOOK-ON BOOTS, SPLIT LEATHER

Size	7 IN. LONG Plain	7 IN. LONG Studded	7 IN. LONG Reinforced	10 IN. LONG Plain	10 IN. LONG Studded	10 IN. LONG Reinforced	Size	7 IN. LONG Plain	7 IN. LONG Studded	7 IN. LONG Reinforced	10 IN. LONG Plain	10 IN. LONG Studded	10 IN. LONG Reinforced
3	$0 45	$0 50	$0 65	$0 65	$0 75	$0 95	4½	$0 60	$0.70	$0.80	$0 85	$1.00	$1 25
3½	50	58	70	.70	80	1 05	5	65	.75	.85	.90	1.10	1.35
4	.55	65	.75	75	90	1 15							

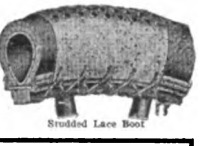
Woodworth Strap Boots

Light Strap Boot

are held on the tire with strong chrome leather straps 1 in. wide which lace through rings on each side and are adjusted by a buckle. These are excellent boots for straight side tires.

Woodworth Lace Boots

Woodworth Lace Boots are held on the tires by lacing with a strong chrome leather lace across the rim. The lace passes through hooks which make it possible to lace them much more quickly and easily than Boots with eyelets.


Studded Lace Boot

PRICE LIST OF STRAP AND LACE BOOTS

Size	7 IN LONG Grain Leather Strap	7 IN LONG Lace	10 IN. LONG Grain Leather Strap	10 IN. LONG Lace
3 or 3½	$1 00	$0 70	$1 40	$1.00
4 or 4½	1 30	0.90	1 85	1 30

Size	7 IN. LONG Grain Leather Strap	7 IN. LONG Lace	10 IN. LONG Grain Leather Strap	10 IN. LONG Lace
5 or 5½	$1 60	$1 00	$2 20	$1 40

Dealers' Discounts We allow to dealers a discount of 15% with an extra 5% for cash on tires and tubes; 20% and 5% for cash on Woodworth Treads, Overshoes and Tire Chains; 30% and 5% for cash on Tire Boots, and Spring Oiler Straps, and 50% and 5% on Fan Belts. If your jobber cannot supply you, send your orders to us and we [illegible]

Cut out this panel before showing to your customers.

LEATHER TIRE GOODS COMPANY, Manufacturers

Canadian Factory
NIAGARA FALLS, ONT.

NIAGARA FALLS, N. Y.

NEW YORK DISTRIBUTORS:

ROSE AUTO SUPPLY CO., Broadway at 57th Street, New York City

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BASKETS

TOURING BASKETS

(See Hampers, Touring)

BATTERIES

DRY BATTERIES

ACME RAPID FIRE—See Nungesser Carbon & Battery Co.

AMERICAN Carbon & Battery Co., Signal Hill, Ill.

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

ANDRAE & Sons Co., Julius, Broadway & Michigan Sts., Milwaukee, Wis. "Sparko."

AUTOCRAT—See Stackpole Carbon Co.

BLUE RIBBON—See Roche Electrical Co.

BULL DOG—See Western Dry Battery Co.

BURN-BOSTON Battery & Mfg. Co., 134 State St., Boston, Mass.

CLEVELAND Battery & Electric Co., 1974 E. 66th St., Cleveland, O. "Hy-Watt." (See page 85.)

COLUMBIA—See National Carbon Co.

EASTERN—See National Carbon Co.

EVEREADY—See American Ever Ready Works.

FLEUR-DE-LIS—See French Battery & Carbon Co.

FRENCH Battery & Carbon Co., Madison, Wis. "Fleur-de-Lis."

HERCULES—See National Carbon Co.

HI-PO Waterproof Battery Co., 1007 Atlantic Ave., Brooklyn, N. Y.

HI-UP—See Manhattan Electrical Supply Co.

HOT SHOT—See National Carbon Co.

HY-WATT—See Cleveland Battery & Electric Co.

J-M—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M."

MANHATTAN Electrical Supply Co., 17 Park Pl., New York, N. Y. "Red Seal," "Hi-Up."

1900—See Nungesser Carbon & Battery Co.

NATIONAL Carbon Co., Cleveland, O. "Columbia," "Eastern," "Hercules," "Standby," "U. S.," "Hot Shot."

NEW STANDARD—See Roche Electrical Co.

NUE—See Union Battery Co.

NUNGESSER Carbon & Battery Co., 1174 E. 38th St., Cleveland, O. "Acme Rapid Fire," "1900." (See page 85.)

POWER—See Union Battery Co.

RED SEAL—See Manhattan Electrical Supply Co.

RED SHIELD—See Wesco Supply Co.

RED STAR—See White Star Battery Co.

ROCHE Electrical Co., Wm., 487 Greenwich St., New York, N. Y. "Yates-Roche," "New Standard," "Blue Ribbon."

SPARKO—See Andrae & Sons Co.

STACKPOLE Carbon Co., St. Mary's, Pa. "Autocrat," "Wizard." (See page 125.)

STANDBY—See National Carbon Co.

UNION Battery Co., Belleville, N. J. "Nue." "Power."

U. S.—See National Carbon Co.

UNIVERSAL Carbon Co., Dundee, Ill.

WASHINGTON Automobile Supply Co., Washington, Ill.

WESCO Supply Co., Seventh St. & Clark Ave., St. Louis, Mo. "Red Shield."

WESTERN Dry Battery Co., 2225-31 First Ave., S., Seattle, Wash. "Bull Dog."

WHITE Star Battery Co., 126 Chambers St., New York, N. Y. "Red Star."

WIZARD—See Stackpole Carbon Co.

YATES-ROCHE—See Roche Electrical Co.

STORAGE BATTERIES

ACME Electric Storage Battery Co., 208 S. La Salle St., Chicago, Ill.

AJAX—See Ajax-Accumulator Co.

AJAX-ACCUMULATOR Co., 414 Rush St., Chicago, Ill. "Ajax."

AMERICAN Battery Co., 1132-34 Fulton St., Chicago, Ill. "Invincible."

AMERICAN Ever Ready Works, Long Island City, N. Y. "Geiszler," "Midget."

AMERICAN Storage Battery Co., Cambridge, Mass. "Harvard."

AMPVO Battery Co., 3031 Michigan Ave., Chicago, Ill.

APELCO—See Apple Electric Co.

APPLE Electric Co., Newark, N. J. "Apelco."

ASHBROOK Electric Co., 4111 Ravenswood Ave., Chicago, Ill. "Satisfaction."

BISON Storage Battery Co., 33 Riley St., Buffalo, N. Y.

BROWN-SMITH Battery Co., Bloomington, Ind.

COMBAT—See Commercial Battery Co.

COMMERCIAL Battery Co., 2106-10 Michigan Ave., Chicago, Ill. "Combat."

COOK Railway Signal Co., 1793 S. Broadway, Denver, Colo. "Re Vivo."

DETROIT Battery Co., 607-09 W. Fort St., Detroit, Mich.

DOTY Battery Works, R. B., 11525 Kelton Ave., Cleveland, O. "Lawrence."

DURO—See Vivax Storage Battery Co.

EDISON Storage Battery Co., 131 Lakeside Ave., Orange, N. J.

ELECTRIC Storage Battery Co., Allegheny Ave., & 19th St., Philadelphia, Pa. "Exide," "Hycap-Exide."

ELECTRIC Storage Battery & Mfg. Co., Cincinnati, O. "Hydrox."

ELECTRIC Supply & Battery Co., 1424 Woodland Ave., S. E., Cleveland, O.

ESSEX Storage Battery & Supply Co., 272 Halsey St., Newark, N. J.

EXIDE—See Electric Storage Battery Co.

FIRE FLY—See Hoosier Storage Battery Co.

G L B—See General Lead Batteries Co.

GEISZLER—See American Ever Ready Works.

Complete Index to Classification appears on Pages 8 to 27.

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HY-WATT
TRADE MARK

Electric Batteries

Long Life High Current
More Power
Guaranteed Waterproof
Sturdy Compact Handy

Only 2 points of connections for 3, 4½, 6, 7½, 9 and 12 Volts at 60 Amperes or better.

Write for Introductory Proposition. Your territory may be open.

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NUNGESSER BRUSHES FOR AUTOMOBILE Starting Motors and Lighting Generators

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Reasonable in Price

Write for Catalog No. 7

The
NUNGESSER
Carbon & Battery Co.
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Acme Rapid Fire Batteries
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Gould
STORAGE BATTERY

The
Strong Right Arm
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Starting-Lighting System

Gould Storage Battery Co.
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Write for our Agency Proposition

Willard STORAGE BATTERY

"The owner's satisfaction is the maker's protection."

Upon this belief nearly 150 makers of electrically equipped motor cars base their choice of Willard batteries.

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BATTERIES (Continued)

STORAGE BATTERIES (Continued)

GENERAL Lead Batteries Co., Chapel St. & Lister Ave., Newark, N. J. "G L B."

GENERAL Storage Battery Co., 2005 Locust St., St. Louis, Mo.

GOULD Storage Battery Co., 30 E. 42d St., New York, N. Y.
(See page 85.)

HARVARD—See American Storage Battery Co.

HEISSLER Storage Battery Co., 1436 Michigan Blvd., Chicago, Ill.

HELIOS—See National Carbon Co.

HOBO—See Hoosier Storage Battery Co.

HOOSIER Storage Battery Co., 202 First St. (Upper), Evansville, Ind. "Fire Fly," "Hobo."

HUDSON-FULTON—See Storage Battery Supply Co.

HYCAP-EXIDE—See Electric Storage Battery Co.

HYDROX—See Electric Storage Battery & Mfg. Co.

INVINCIBLE—See American Battery Co.

JEWELL Electric Co., 732 Sherman St., Chicago, Ill.

KEELER Battery Co., 134 Ontario St., Toledo, O.

KENTUCKY Revivo Battery Co., 832 W. Jefferson St., Louisville, Ky. "Revivo."

KREMLO—See McCauley Storage Battery Co.

LBA—See Willard Storage Battery Co.

LAWRENCE—See Doty Battery Works.

McCAULEY Storage Battery Co., 1060 St. Clair Ave., E., Cleveland, O. "Kremlo."

MARKO, Paul M., 1191 Bedford Ave., Brooklyn, N. Y.

MASCO—See Milwaukee Auto Specialty Co.

MEDER-STAUDT Co., 1904 Broadway, New York, N. Y. "Wetherbee."

MENTZER & Co., J. P., 134 S. La Salle St., Chicago, Ill.

MIDGET—See American Ever Ready Works.

MILWAUKEE Auto Supply Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium," "Masco."

MOUND City Battery Co., 17 S. Boyle St., St. Louis, Mo.

MULLER, Albert, Hoffman Blvd. & Hillside Ave., Jamaica, N. Y. "Porox."

MULTIPLE Storage Battery Co., 427 W. 50th St., New York, N. Y.

NATIONAL Carbon Co., Cleveland, O. "Helios."

NORTHWESTERN Storage Battery Co., Milwaukee, Wis.
(See page 307.)

PERFECTION Storage Battery Co., 2901-09 Indiana Ave., Chicago, Ill.

PERMALITE—See Union Motor Device Co.

PHILADELPHIA Storage Battery Co., Ontario & C Sts., Philadelphia, Pa.
(See page 781.)

POROX—See Muller, Albert.

PREMIER Electric Co., 4053 Ravenswood Ave., Chicago, Ill.
(See page 559.)

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind.
(See page 553.)

RADIUM—See Milwaukee Auto Specialty Co.

RE VIVO—See Cook Railway Signal Co.

RELIABLE—See Storage Battery Supply Co

RELIANCE—See Storage Battery Supply Co

REVIVO—See Kentucky Revivo Battery Co.

REX Battery Co., 2505-09 S. State St., Chicago, Ill.

S. O. S.—See Victor Storage Battery Co.

SALOM Electric Storage Battery Corp., Niagara Falls, N. Y.

SATISFACTION—See Ashbrook Electric Co.

SCHUG Electric Mfg. Co., 826 Jefferson Ave., Detroit, Mich.

SILVEY Electric Co., 10-16 S. Canal St., Dayton, O.

STORAGE Battery Supply Co., 239 E. 27th St., New York, N. Y. "Reliance," "Reliable," "Hudson-Fulton."

UNION Motor Device Co., Meridian & Tenth Sts., Indianapolis, Ind. "Permalite."
(See page 863.)

U-S-L—See U S Light & Heat Corp.

U S Light & Heat Corp., Niagara Falls, N. Y. "U-S-L."
(See page 295.)

UNIVERSAL Battery Co., 3410-24 S. La Salle St., Chicago, Ill.

VENUS Dry Storage Battery Co., Detroit, Mich.

VENUS Electric Lamp Co., 64 Second Ave., Detroit, Mich.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

VICTOR Storage Battery Co., 2400 Fourth Ave., Rock Island, Ill. "S. O. S."

VIVAX Storage Battery Co., Hinsdale, Ill. "Duro."

VOLKCAR Storage Battery Co., 2441 Michigan Ave., Chicago, Ill.

WETHERBEE—See Meder-Staudt Co.

WILLARD Storage Battery Co., Cleveland, O. "Lba."
(See page 85.)

WRIGHT Storage Battery Co., North Rd., Poughkeepsie, N. Y.

ZOAR Battery Co., Zoar, O.

BEARINGS

BALL BEARINGS

(For Bearing Parts—See Balls, Steel; also Cups, Ball; also Retainers, Ball)

AMERICAN Ball Co., 115 Clifford St., Providence, R. I.

AUBURN Ball Bearing Co., 27 Elizabeth St., Rochester, N. Y.
(See page 111.)

B. K. F.—See Lehman Mfg. Co.

Complete Index to Classification appears on Pages 8 to 27.

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CATALOG *of*

HESS-BRIGHT BALL BEARINGS

THE INIMITABLE BEARING

Specifications, prices and all information essential to ordering promptly and correctly

The Hess-Bright Manufacturing Co.

Philadelphia

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For the convenience of the trade and for the purpose of placing before it the means of ready access to such data as is needed in the purchase of ball-bearings, especially for replacement purposes, we have compiled and printed the following pages and have furthermore inserted our list of distributors from whose stocks these bearings can be obtained at the same prices as direct from us. Many dealers, garage men and repair men have failed to recognize the opportunity which they might take of earning a profit not only on the labor and time of replacing bearings but on the bearings themselves.

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The accompanying prices are list and subject to a liberal discount to you. This discount is sufficiently large to enable you to save money for your patrons by re-selling to them at 20% below these list prices and at the same time make a generous profit.

Remember that nearly every make of ball bearings is interchangeable with HESS-BRIGHTS, and for whatever replacements you may have you can no doubt select the proper bearings from the tables herewith.

Note When Ordering

PRICES—All prices are subject to change without notice.

TERMS—Orders for small quantities of bearings should be accompanied by check or money order, otherwise shipment will be made C.O.D.

SHIPPING INSTRUCTIONS—Unless shipping instructions accompany each order, shipments are routed at our discretion.

GUARANTEE—Our GUARANTEE covers defects of material or workmanship developed within one year from date of sale. We will remake or replace, free of charge, *at our factory*, any bearing returned to us, transportation prepaid, which our examination discloses to have been defective.

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Interchangeability

Hess-Bright Ball Bearing sizes have been adopted by nearly all other ball bearing manufacturers. The bearings may therefore be used to replace other makes. The following tables cover the more commonly used sizes. The first column is the size symbol used by Hess-Bright (HB-DWF) and several others. The other columns give the trade symbols of various other makes. While some of these other makes of bearings are not sold in the United States any more, we give their symbols in case you are compelled to replace any of them of earlier date.

200 Series (Light)

HB				
200	0000A	200a	A10	1200
201	000A	201a	A12	1201
202	00A	202a	A15	1202
203	0A	203a	A17	1203
204	1A	204a	A20	1204
205	2A	205a	A25	1205
206	3A	206a	A30	1206
207	4A	207a	A35	1207
208	5A	208a	A40	1208
209	6A	209a	A45	1209
210	7A	210a	A50	1210
211	8A	211a	A55	1211
212	9A	212a	A60	1212
213	10A	213a	A65	1213
214	11A	214a	A70	1214
215	12A	215a	A75	1215
216	13A	216a	A80	1216
217	14A	217a	A85	1217
218	15A	218a	A90	1218
219	16A	219a	A95	1219
220	17A	220a	A100	1220
221	18A	221a	A105	1221
222	19A	222a	A110	1222

300 Series (Medium)

HB				
300	1B	300a	B10	1300
301	2B	301a	B12	1301
302	3B	302a	B15	1302
303	4B	303a	B17	1303
304	5B	304a	B20	1304
305	6B	305a	B25	1305
306	7B	306a	B30	1306
307	8B	307a	B35	1307
308	9B	308a	B40	1308
309	10B	309a	B45	1309
310	11B	310a	B50	1310
311	12B	311a	B55	1311
312	13B	312a	B60	1312
313	14B	313a	B65	1313
314	15B	314a	B70	1314
315	16B	315a	B75	1315
316	17B	316a	B80	1316
317	18B	317a	B85	1317
318	19B	318a	B90	1318
319	20B	319a	B95	1319
320	21B	320a	B100	1320
321	22B	321a	B105	1321
322	23B	322a	B110	1322

400 Series (Heavy)

403	1C	403a	C17	
404	2C	404a	C20	
405	3C	405a	C25	1405
406	4C	406a	C30	1406
407	5C	407a	C35	1407
408	6C	408a	C40	1408
409	7C	409a	C45	1409
410	8C	410a	C50	1410
411	9C	411a	C55	
412	10C	412a	C60	
413	11C	413a	C65	
414	12C	414a	C70	
415				
416	13C	416a	C80	
417				
418	14C	418a	C90	
419				
420	15C	420a	C100	

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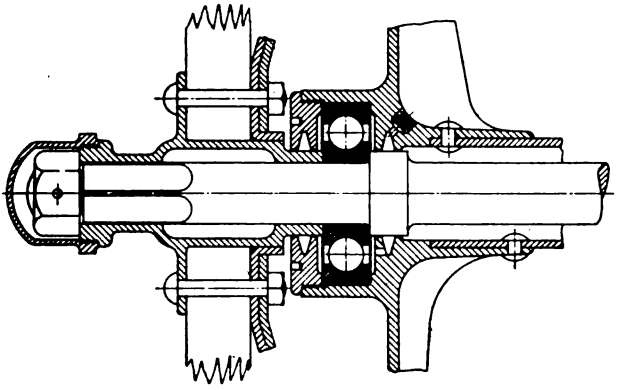
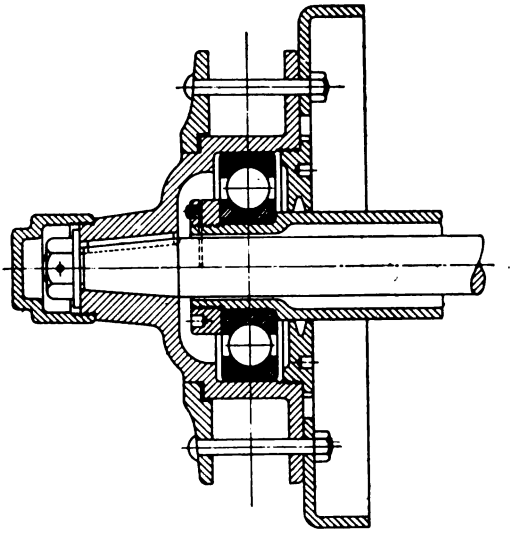
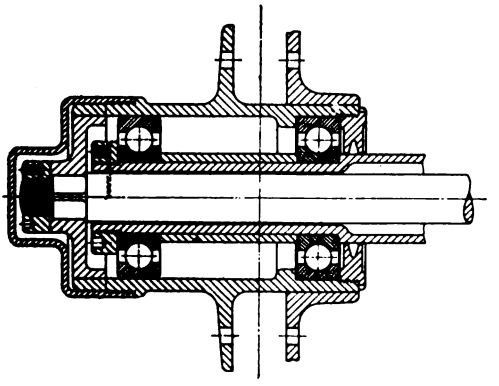
Three Types of Mountings for Rear Hubs



Semi-Floating



Three-Quarter Floating



Full Floating

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Annular Bearings—Mounting Directions

REASONS FOR CERTAIN MOUNTING DIRECTIONS: The inner race should be a permanently tight fit on the shaft; otherwise the continued action of the load, concentrated on the short shaft length corresponding to the bearing width, will peen down the shaft; in time, and particularly with soft shaft material or ordinary lathe or file polish fits, this will bring about a serious cutting of the shaft.

A reliance on a drive fit alone is not sufficient, as that may be destroyed by an occasional dismounting or by the action referred to. Binding the inner race endwise between a substantial shoulder and well-set-up nut creates a frictional grip on the shoulder and nut faces that prevents the transfer to the shaft surface of the destructive influences cited: this binding forms a very efficient substitute for bearing seat length. Neglect of this direction results more generally in damage to the shaft, but occasionally also to the bearing. When structural reasons make it advisable to have the inner race a slip fit on the shaft instead of a drive, the endwise binding must on no account be omitted.

The outer race should be a sucking fit in the housing. If this race is fixed against rotation, the load will always come on the same place; if it can take up a different position occasionally, new sections will come under the influence of the load. A sucking fit of the race will be accompanied by a slow, intermittent creep under the slight vibrations of the load. In order not to prevent this creep, the sides of this race should never be absolutely clamped, even when the race is held between shoulders to prevent end movement of a shaft; a slight clearance 1/100 of an inch, or as much as is admissible, should be left on each side.

If the outer race is a tight or driving fit in the housing, it is impossible, in assembly, to be sure the bearing is not assembled out of line, due to the narrow width of the bearing compared with the diameter. In fact, it is nearly a certainty the outer race will be cramped or out of line when assembled under such conditions, with the consequent rapid destruction of bearing races and balls. Such bearings will appear as if subjected to a heavy end thrust and overloaded.

ENCLOSURES should be such as to retain lubricant and exclude dust and moisture. Drawings of efficient and simple devices on application.

LUBRICANTS: These may range from the lightest of spindle oils at high speeds to fairly heavy greases at low speeds. An excess of lubricant, enough to force out at the closures, should be employed whenever the entrance of grit or moisture is to be feared. Lubricants containing or developing acid must be avoided, as must those that become rancid. Never use any oil or grease containing graphite.

INTERCHANGEABILITY AND ACCURACY: All "HB" (American) and "DWF" (German and French) radial bearings are accurate as to the bore within 0.0002″ plus and 0.0004″ minus. Outside diameter from 0 to 0.0006″, 0 to 0.0008″, 0 to 0.0012″ minus, depending upon the size of the bearing. As to the width from 0 to 0.002″ minus.

These accuracies are necessary for economical shopwork in mounting the bearings. Greater limits of tolerance than these will result in either inferior work or the necessity of costly special fitting of each piece to its bearing. The extra price that these close "HB" limits necessitate is more than made up in manufacturing economy and the certainty of replacement without dismantling parts for refitting.

OLD BEARINGS AND WEAR: A properly made and not overloaded bearing will not show wear in the ordinary sense of plain bearings, i. e., a reduction of the diameter and increase in bore. That and reduction in

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Annular Bearings—Mounting Directions

ball diameter can occur only when abrasive grit is admitted to the bearing. Grit will quickly grind down a bearing at a rate depending only upon the sharpness of the grit and the amount of time the bearing is exposed to it.

An overloaded bearing will not be worn, but the surfaces of the balls and races will be destroyed; that will show first by minute pin holes and later by flaking. A large ball will take more than its share of the load and may therefore bring about all the appearances of an overloaded bearing; to avoid this, no ball must vary by more than 0.0001" from its fellows in the same bearing. It is on this account that bearings must never be dismembered, as otherwise balls are likely to be mixed; neither must repairs be made by adding balls to a set. Such repairs should be undertaken only by us, where full sets of even size balls are available. The balls of commerce are never sold within these necessary limits.

Rust is absolutely destructive to a ball bearing. It is very readily recognized; even in a bearing which has been cleaned so that no red rust is to be seen, the presence of more or less pronounced pits and excoriations, not only on the race surfaces, but also on the other parts of the bearing, is clear evidence. These pits are very distinct in appearance from those due to overload; aside from that, overload pits are necessarily confined to the balls and the ball tracks.

Although to many the presence of acid in many lubricants is well enough known, its destructive effect is not generally conceded, but attributed to rust and overload. Nevertheless, it is a very serious menace with some lubricants; its ravages are clearly enough distinguished from overload, because they are found elsewhere than on the balls and ball tracks; the marks are also quite distinct from rust marks; the acid marks often are pits, but always show also clearly-defined irregular etchings, similar to, though less pronounced than, those produced by acid etching of damascened gun-barrels.

LOOSE BEARINGS: A very considerable rocking freedom of the one race with reference to the other as the result of grit cutting will do no harm. An amount of rocking that at first seems alarming in the individual bearing may be due to a radial clearance of but few thousandths of an inch. It is the radial clearance which determines the further usefulness of the bearing; as two bearings are always used at some distance apart in the support of a shaft or wheel, these latter cannot rock by more than the radial freedom of the bearings, not by their angular freedom. To determine its true radial freedom, the bearing must be so held that the races are moved only crosswise without any lengthwise or tilting motion.

BEARING REMAKING: Bearings in which the balls or ball tracks are pitted or roughed up from rust, acid or overload cannot be remade.

Bearings that are ground down by grit so as to be loose, can be put in good order by the introduction of a new set of larger balls. The same amount of care must be exercised to have all these balls within 0.0001" as with a new bearing; it will not do to put in a few new balls only, nor will it do to accept a dealer's belief that the balls in his bin are within the necessary limit. Unless this grinding action has lasted too long, it will be practicable to restore the bearing to somewhere near its original condition; even though such refilled bearing should be somewhat looser than a new one that does not justify the expense of a replacement. — See "LOOSE BEARINGS" above.

The loads cited for radial bearings are safe for steady speeds as given and constant load, free from shock. For all other conditions suitable allowances must be made as dictated by our experience; information cheerfully furnished on application.

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Annular Bearings—Light 200 Series

No. of Bearing	List Prices	Bore		Diameter		Width	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
200	$3.00	10	0.3937	30	1.1811	9	0.3543
201	3.20	12	0.4724	32	1.2598	10	0.3937
202	3.50	15	0.5906	35	1.3780	11	0.4331
203	4.00	17	0.6693	40	1.5748	12	0.4724
204	4.75	20	0.7874	47	1.8504	14	0.5512
205	5.25	25	0.9843	52	2.0473	15	0.5906
206	6.25	30	1.1811	62	2.4410	16	0.6299
207	6.85	35	1.3780	72	2.8347	17	0.6693
208	7.50	40	1.5748	80	3.1496	18	0.7087
209	9.00	45	1.7717	85	3.3465	19	0.7480
210	10.00	50	1.9685	90	3.5433	20	0.7874
211	12.50	55	2.1654	100	3.9370	21	0.8268
212	14.50	60	2.3622	110	4.3307	22	0.8661
213	16.50	65	2.5591	120	4.7244	23	0.9055
214	18.75	70	2.7559	125	4.9213	24	0.9449
215	21.50	75	2.9528	130	5.1181	25	0.9843
216	24.10	80	3.1496	140	5.5118	26	1.0236
217	27.80	85	3.3465	150	5.9055	28	1.1024
218	30.30	90	3.5433	160	6.2992	30	1.1811
219	33.50	95	3.7402	170	6.6929	32	1.2598
220	37.00	100	3.9370	180	7.0866	34	1.3386
221	42.00	105	4.1339	190	7.4804	36	1.4173
222	48.00	110	4.3307	200	7.8741	38	1.4961

Annular Bearings—Medium 300 Series

No. of Bearing	List Prices	Bore		Diameter		Width	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
300	$3.90	10	0.3937	35	1.3780	11	0.4331
301	4.20	12	0.4724	37	1.4567	12	0.4724
302	4.50	15	0.5906	42	1.6536	13	0.5118
303	5.00	17	0.6693	47	1.8504	14	0.5512
304	5.90	20	0.7874	52	2.0473	15	0.5906
305	6.90	25	0.9843	62	2.4410	17	0.6693
306	8.10	30	1.1811	72	2.8347	19	0.7480
307	9.50	35	1.3780	80	3.1496	21	0.8268
308	11.90	40	1.5748	90	3.5433	23	0.9055
309	14.50	45	1.7717	100	3.9370	25	0.9843
310	16.00	50	1.9685	110	4.3307	27	1.0630
311	18.00	55	2.1654	120	4.7244	29	1.1417
312	21.00	60	2.3622	130	5.1181	31	1.2205
313	24.00	65	2.5591	140	5.5118	33	1.2992
314	28.00	70	2.7559	150	5.9055	35	1.3780
315	31.00	75	2.9528	160	6.2992	37	1.4567
316	35.00	80	3.1496	170	6.6929	39	1.5354
317	43.50	85	3.3465	180	7.0866	41	1.6142
318	51.50	90	3.5433	190	7.4804	43	1.6929
319	60.00	95	3.7402	200	7.8741	45	1.7717
320	70.00	100	3.9370	215	8.4646	47	1.8504
321	80.00	105	4.1339	225	8.8583	49	1.9291
322	90.00	110	4.3307	240	9.4489	50	1.9685

Annular Bearings—Heavy 400 Series

No. of Bearing	List Prices	Bore		Diameter		Width	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
403	$7.50	17	0.6693	62	2.4410	17	0.6693
404	8.75	20	0.7874	72	2.8347	19	0.7480
405	10.50	25	0.9843	80	3.1496	21	0.8268
406	12.00	30	1.1811	90	3.5433	23	0.9055
407	13.75	35	1.3780	100	3.9370	25	0.9843
408	16.50	40	1.5748	110	4.3307	27	1.0630
409	19.50	45	1.7717	120	4.7244	29	1.1417
410	22.50	50	1.9685	130	5.1181	31	1.2205
411	26.50	55	2.1654	140	5.5118	33	1.2992
412	31.00	60	2.3622	150	5.9055	35	1.3780
413	36.50	65	2.5591	160	6.2992	37	1.4567
414	45.50	70	2.7559	180	7.0866	42	1.6536
415	55.00	75	2.9528	190	7.4804	45	1.7717
416	65.00	80	3.1496	200	7.8741	48	1.8898
417	85.00	85	3.3465	210	8.2678	52	2.0473
418	90.00	90	3.5433	225	8.8583	54	2.1260
419	110.00	95	3.7402	250	9.8426	55	2.1654
420	125.00	100	3.9370	265	10.4331	60	2.3622
421	160.00	105	4.1339	290	11.4174	65	2.5591
422	195.00	110	4.3307	320	12.5985	70	2.7559

The above series by no means represent our complete range of sizes; they are merely those most commonly used in automobile practice. For further information write us.

NOTE:—From the list prices given a discount of 20% is allowed individual purchasers

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Thrust Collar Bearings—Medium Weight Series No. 1100 & 1100F

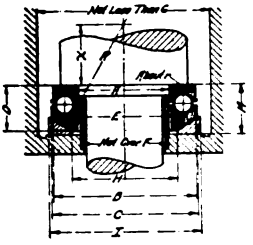

Fig 1

The number completely identifies each bearing.

The inch dimensions are the nearest equivalents to the even millimeters in which the bearings are made. The metric sizes are retained to insure interchangeability of the American-made "Hess-Bright" bearings with German and French DWF.

For the convenience of our customers, we can furnish aligning washers in all sizes listed on this page.

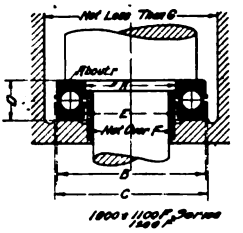

Fig. 2

1100 Series With Spherical Seat. (Fig. 1)

Bearing No.	List Prices	A		B		C		D		E		F	G	R		r		X	
		mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	in.	in.	mm.	in.	mm.	in.	mm.	in.
1102	$4.00	10	0.3937	30	1.18	32	1.26	14	0.55	12	0.47	1/16	1 1/8	25	0.98	1	.04	10.	0.39
1103	4.50	15	0.5906	35	1.38	35	1.38	15	0.59	17	0.67	1/8	1 1/4	30	1.18	1	.04	13.4	0.53
1104	5.35	20	0.7874	42	1.65	42	1.65	16	0.63	22	0.87	1/4	2 1/16	35	1.38	1	.04	16.6	0.65
1105	5.90	25	0.9843	47	1.85	47	1.85	17	0.67	27	1.06	1/8	2 1/4	35	1.38	1	.04	15.	0.59
1106	6.40	30	1.1811	53	2.09	55	2.17	18	0.71	32	1.26	1 1/8	2 3/8	40	1.57	1	.04	17.8	0.70
1107	7.50	35	1.3780	62	2.44	64	2.52	21	0.83	37	1.46	1 1/4	2 11/16	50	1.97	1.5	.06	23.8	0.94
1108	8.60	40	1.5748	64	2.52	66	2.60	21	0.83	42	1.65	1 3/8	3 1/16	50	1.97	1.5	.06	22.4	0.88
1109	9.90	45	1.7717	73	2.87	75	2.95	25	0.98	47	1.85	1 11/16	3 3/8	60	2.36	1.5	.06	28.5	1.12
1110	11.25	50	1.9685	78	3.07	80	3.15	25	0.98	52	2.05	1 1/2	3 3/4	65	2.56	1.5	.06	32.8	1.29
1111	12.85	55	2.1654	88	3.46	90	3.54	28	1.10	57	2.24	2 1/16	4 1/8	70	2.76	1.5	.06	33.6	1.32
1112	13.90	60	2.3622	90	3.54	92	3.62	28	1.10	62	2.44	2 1/8	4 1/2	75	2.95	1.5	.06	38.	1.50
1113	15.50	65	2.5591	100	3.94	102	4.02	32	1.26	67	2.64	2 3/16	4 5/8	80	3.15	2	.08	38.4	1.51
1114	17.10	70	2.7559	103	4.06	105	4.13	32	1.26	72	2.83	2 1/4	4 11/16	85	3.35	2	.08	42.8	1.69
1115	18.75	75	2.9528	110	4.33	110	4.33	32	1.26	77	3.03	2 5/16	4 13/16	90	3.54	2	.08	47.	1.85
1116	20.35	80	3.1496	115	4.53	118	4.65	35	1.38	82	3.23	3	5 1/8	95	3.74	2	.08	48.4	1.91
1117	26.75	85	3.3465	125	4.92	132	5.20	38	1.50	88	3.46	3 3/16	5 15/16	105	4.13	2	.08	55.	2.17
1118	30.00	90	3.5433	135	5.32	135	5.32	38	1.50	93	3.66	3 3/8	6	110	4.33	2.5	.10	59.	2.32
1119	33.15	95	3.7402	140	5.51	145	5.71	41	1.61	98	3.86	3 1/2	6 1/8	115	4.53	2.5	.10	60.	2.36
1120	35.50	100	3.9370	150	5.91	150	5.91	41	1.61	103	4.06	3 11/16	6 1/2	125	4.92	2.5	.10	70.	2.76
1121	38.00	105	4.1339	155	6.10	157	6.18	46	1.81	108	4.25	4	7	130	5.12	2.5	.10	69.5	2.74

1100 Series With Flat Seat. (Fig. 2)

Bearing No.	List Prices	A		B		C		D		E		F	G	r	
		mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	in.	in.	mm.	in.
1102F	$3.30	10	0.3937	30	1.18	32	1.26	12	0.47	12	0.47	1/16	1 1/8	1.	0.04
1103F	3.65	15	0.5906	35	1.38	35	1.38	14	0.55	17	0.67	1/8	1 1/4	1.	0.04
1104F	4.25	20	0.7874	42	1.65	42	1.65	14	0.55	22	0.87	1/4	2 1/16	1.	0.04
1105F	4.75	25	0.9843	47	1.85	47	1.85	14	0.55	27	1.06	1/8	2 1/4	1.	0.04
1106F	5.25	30	1.1811	53	2.09	55	2.17	15	0.59	32	1.26	1 1/8	2 3/8	1.	0.04
1107F	6.25	35	1.3780	62	2.44	64	2.52	18	0.71	37	1.46	1 1/4	2 11/16	1.5	0.06
1108F	7.25	40	1.5748	64	2.52	66	2.60	18	0.71	42	1.65	1 3/8	3 1/16	1.5	0.06
1109F	8.50	45	1.7717	73	2.87	75	2.95	20	0.79	47	1.85	1 11/16	3 3/8	1.5	0.06
1110F	9.50	50	1.9685	78	3.07	80	3.15	20	0.79	52	2.05	1 1/2	3 3/4	1.5	0.06
1111F	11.00	55	2.1654	88	3.46	90	3.54	24	0.94	57	2.24	2 1/16	4 1/8	1.5	0.06
1112F	12.00	60	2.3622	90	3.54	92	3.62	24	0.94	62	2.44	2 1/8	4 1/2	1.5	0.06
1113F	13.00	65	2.5591	100	3.94	102	4.02	27	1.06	67	2.64	2 3/16	4 5/8	2.	0.08
1114F	14.50	70	2.7559	103	4.06	105	4.13	27	1.06	72	2.83	2 1/4	4 11/16	2.	0.08
1115F	16.00	75	2.9528	110	4.33	110	4.33	27	1.06	77	3.03	2 5/16	4 13/16	2.	0.08
1116F	17.50	80	3.1496	115	4.53	118	4.65	31	1.22	82	3.23	3	5 1/8	2.	0.08
1117F	23.00	85	3.3465	125	4.92	132	5.20	34	1.34	88	3.46	3 3/16	5 15/16	2.	0.08
1118F	25.50	90	3.5433	135	5.31	135	5.31	36	1.42	93	3.66	3 3/8	6	2.5	0.10
1119F	28.00	95	3.7402	140	5.51	145	5.71	38	1.50	98	3.86	3 1/2	6 1/8	2.5	0.10
1120F	30.25	100	3.9370	150	5.91	150	5.91	38	1.50	103	4.06	3 11/16	6 1/2	2.5	0.10
1121F	32.50	105	4.1339	155	6.10	157	6.18	40	1.57	108	4.25	4	7	2.5	0.10

The above two series cover only the thrust bearings commonly used in automobile practice. For complete range of thrust bearing sizes and types send for our booklet of bearing sizes.

NOTE:—From the list prices given a discount of 20% is allowed individual purchasers

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HESS-BRIGHT

City		Address
Akron, Ohio	The Hardware & Supply Co	21-29 Market St.
Atlanta, Ga	Osburn Automobile Supply Co	399 Peachtree St.
Baltimore, Md	Auto Supply Co. of Baltimore	217 W. Saratoga St.
Binghamton, N. Y	R. W. Whipple	221 Washington St.
Birmingham, Ala	Drennen Motor Car Co	Ave. C and 20th St.
Boston, Mass	Post & Lester Co	225 Columbus Ave.
Bridgeport, Conn	Post & Lester Co	278 Fairfield Ave.
Brooklyn, N. Y	Martin-Evans Co	1186 Bedford Ave.
Buffalo, N. Y	James G. Barclay, Inc	715-717 Main St.
Butte, Mont	Silver Bow Motor Car Co	Cor. Park and Idaho Sts.
Chattanooga, Tenn	The Southern Auto Supply Co	730 Broad St.
Chicago, Ill	The Bearings Shop	1402 Michigan Ave.
Cincinnati, Ohio	The Ohio Rubber Co	228 W. 7th St.
Cleveland, Ohio	City Auto Tire & Supply Co	2352 Euclid Ave.
Colo. Springs, Colo	Auto Equipment Co	19 E. Kiowa St.
Columbia, S. C	Gibbes Machinery Co	Wheat and Assembly Sts.
Columbus, Ohio	Griswold-Sohl Co	79 and 81 N. Front St.
Dallas, Texas	Ferris-Dunlap Auto Supply Co	2029 Commerce St.
Davenport, Iowa	Sieg Iron Co	302-28 E. 5th St.
Dayton, Ohio	Dayton Auto Service Co	Cor. Bacon and McDonough Sts.
Denver, Colo	Auto Equipment Co	1554-58 Broadway
Des Moines, Iowa	Hippee-Henley Motor Supply Co	710 Mulberry St.
Elmira, N. Y	Barker, Rose & Clinton Co	109 Lake St.
El Paso, Texas	Borderland Auto Supply Co	Myrtle and Kansas Sts.
Erie, Pa	LeJeal Cycle & Mobile Works	1721 Sassafras St.
Fort Wayne, Ind	Ft. Wayne Auto Supply Co	122 Washington Blvd. W
Fresno, Cal	Wells-Brown Co	Kern St. and Van Ness Blvd.
Harrisburg, Pa	Front-Market Motor Supply	Front & Market Sts.
Hartford, Conn	Post & Lester Co	112 Allyn St.
Hartford, Conn	Post & Lester Co	175 Asylum St.
Houston, Texas	Houston Speedo. Ser. Sta. Co	1212 Main St.
Indianapolis, Ind	Fisher Automobile Co	400 N. Capital Blvd.
Jacksonville, Fla	McGraw-Herman Co	427 Main St.
Kansas City, Mo	Kansas City Auto. Sup. Co	1504 Grand Ave
Lincoln, Neb	Nebraska Buick Automobile Co	140 N. 13 St.
Los Angeles, Cal	E. A. Featherstone	1018 S. Main St.
Louisville, Ky	Louisville Auto Supply Co	307 W. Broadway.
Macon, Ga	S. S. Parmelee Co	Cor. 2d and Poplar Sts.
Memphis, Tenn	Osburn Auto. Supply Co	3rd St. & Monroe Ave.
Milwaukee, Wis	Milwaukee Tire & Supply Co	457 Milwaukee St.
Minneapolis, Minn	Fenstermacher Auto. Supply Co	211 S. 5th St.
Montgomery, Ala	Hobbie Motor Car Co	222 Montgomery St.

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DISTRIBUTORS

City		Address
Nashville, Tenn.	Hirsig Company	901-03 Broadway
Newark, N. J.	Banister & Pollard Co	206-08 Market St.
New Haven, Conn.	Post & Lester Co	1085 Chapel St.
New Orleans, La.	Shuler Rubber & Supply Co	613 Baronne St.
New York, N. Y.	The Hess-Bright Co	1974 Broadway
Oklahoma City, Okla.	Burwell-Smith Supply Co	416 N. Broadway
Omaha, Neb.	Powell Supply Co	2051 Farnam St.
Peoria, Ill.	Graham-Seltser Co	120-122 Main St.
Philadelphia, Pa.	Hess-Bright Co	666 N. Broad St.
Pittsburg, Pa.	Joseph Woodwell Co	201 Wood St.
Portland, Me.	Maine Motor Car Co	Free and South Sts.
Portland, Ore.	Ballou & Wright	Broadway at Oak
Providence, R. I.	Post & Lester Co	174 Washington St.
Pueblo, Colo.	Auto Equipment Co	214 W. 4th St.
Richmond, Va.	Dallas A. Shafer & Co	808 W. Broad St.
Rochester, N. Y.	Gibaud's Roch. Auto Supply Co	352 Main St., E.
Rockford, Ill.	Eric J. Gustafson	Opp. Water Works Park
St. Louis, Mo.	Phoenix Auto Supply Co	3225 Locust St.
Salt Lake City, Utah.	Salt Lake Hardware Co	257 Main St.
San Antonio, Texas	H. G. Guenther	515 Main St.
San Diego, Cal.	Gavin-Williams Co.	1300 Fifth St. cor. A.
San Francisco, Cal.	McCoy Motor Supply Co	251 Holbrook Ave.
Savannah, Ga.	Harris Tire Co	Drayton & Perry Sts.
Scranton, Pa.	Chas. B. Scott Co	119 Franklin Ave.
Seattle, Wash.	Ballou & Wright	817 E. Pike St.
Sioux City, Iowa	Haller Bros. Auto Supply Co	413 Pearl St.
Spokane, Wash.	Kilmer & Sons Co	1001-07 First Ave.
Springfield, Mass.	Post & Lester Co	270 Worthington St.
Syracuse, N. Y.	Syracuse Auto Supply Co	311 S. Warren St.
Tampa, Fla.	Wholesale Auto Supply House of Tampa	309 Washington St.
Terre Haute, Ind.	John S. Cox	222 S. 7th St.
Toledo, Ohio	Union Supply Co	231 Superior St.
Utica, N. Y.	Utica Cycle & Supply Co	117-119 Columbia St.
Washington, D. C.	Miller-Dudley Co	1625 14th St. N. W.
Waterbury, Conn.	Post & Lester Co	186 Grand St.
Wichita, Kan.	C. A. Hagberg Rubber Co	114-116 S. Lawrence St.
Worcester, Mass.	Post & Lester Co	12 Mechanic St.

FOREIGN

Calgary, Alta., Can.	The Motor Car Supply Co., Ltd.	607 First St. W.
Edmonton, Alta., Can.	The Motor Car Supply Co., Ltd.	
Toronto, Ont., Can.	W. R. Sachs	77 Adelaide St. W.
San Juan, Porto Rico.	Pietrantoni & Sojo	
Ponce, Porto Rico	Pietrantoni & Sojo	
Havanna, Cuba	José Lopes Rodrigues "Garage Moderno".	Obrapia 87 y 89
Vancouver, B. C.	Maritime Motor Car Co	13th Ave. and Granville St.

Distributors' prices to individuals are 20% from list.

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In every city of importance can be found an authorized distributor of

HESS-BRIGHTS

Note List of Distributors on Preceding Pages

This is a feature of our service which we have developed with the idea of enabling dealers, garages, repair shops and supply houses to accept orders for bearing replacements and in doing so to be in a position to give assurance of prompt delivery. This is essential to the truck owner, gratifying to the pleasure car owner and in all cases advantageous to the trade. Order from the nearest distributor. The prices and discounts will be the same as from us direct.

The Hess-Bright Mfg. Co.

Front Street and Erie Avenue

Philadelphia, Pa.

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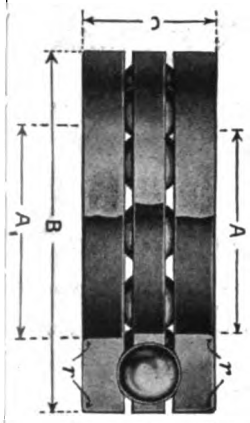

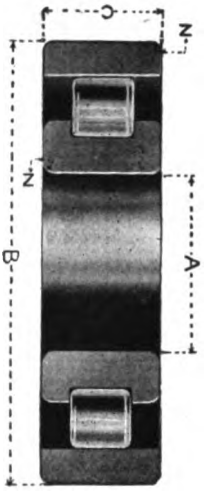

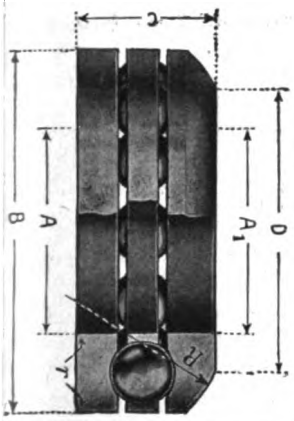

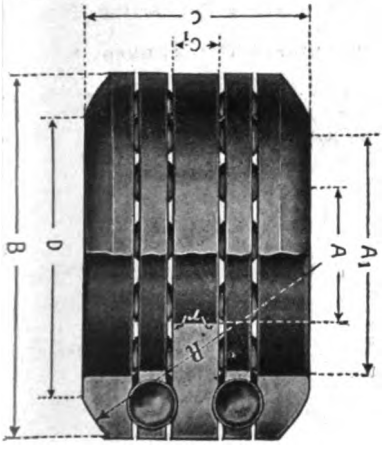

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BALL AND ROLLER BEARINGS

We manufacture a complete line of standard size and types of Anti-Friction Bearings, also manufacture Ball and Roller Bearings to specifications.

We can furnish Radial Roller Bearings to interchange with standard sizes of Radial Ball Bearings. These bearings have much greater carrying capacity than Ball Bearings. Have you any installation where Radial Ball Bearing do not stand up successfully and will not permit of a larger size bearing? If so, our Radial Roller Bearing will meet your requirements.

Information cheerfully furnished.

The Ball & Roller Bearing Co., Danbury, Conn., U.S.A.

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BEARINGS (Continued)

BALL BEARINGS (Continued)

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(See page 99.)

BANTAM Anti-Friction Co., Bantam, Conn.

BARTHEL & Daly, 1790 Broadway, New York, N. Y. (Importers.) "Schafer."

BEARINGS Co. of America, 250 W. 54th St., New York, N. Y. (Importers.) "F & S."
(See page 115.)

CLEVELAND Ball-Bearing Co., Cleveland, O.

D. W. F.—See Hess-Bright Mfg. Co.

EUREKA Ball Bearing Co., 515-17 Forest Ave., Detroit, Mich.

F & S—See Bearings Co. of America.

FAFNIR Bearing Co., New Britain, Conn.

G-A Ball Bearing Co., Lake & Albany Sts., Chicago, Ill.

GURNEY Ball Bearing Co., Jamestown, N. Y.
(See page 703.)

GWILLIAM Co., 253 W. 58th St., New York, N. Y. (Distributors.)
(See page 679.)

H-B—See Hess-Bright Mfg. Co.

HESS-BRIGHT Mfg. Co., Philadelphia, Pa. "H-B," "D. W. F."
(See pages 87 to 98 and Front Cover.)

IMPERIAL Bearing Co., Detroit, Mich.

LEHMAN Mfg. Co., J. H., 727 Seventh Ave., New York, N. Y. (Importers.) "B. K. F."

MARBURG Bros., 1790 Broadway, New York, N. Y. (Importers.) "S. R. O."
(See page 329.)

MATHEWS Mfg. Co., H. A., Seymour, Conn.

NEW Departure Mfg. Co., Bristol, Conn.
(See page 101.)

NICE Ball Bearing Co., Land Title Bldg., Philadelphia, Pa.

NORMA Co. of America, 1790 Broadway, New York, N. Y.
(See page 68.)

R. B. F.—See Rhineland Machine Works Co.

R. I. V. Co., 254 W. 57th St., New York, N. Y. (Importers.)

R. W. F.—See Riebe Ball Bearing Co.

RHINELAND Machine Works Co., 1737 Broadway, New York, N. Y. (Importers.) "R. B. F."

RIEBE Ball Bearing Co., 1790 Broadway, New York, N. Y. (Importers.) "R. W. F."

ROCKWELL-DRAKE Corporation, 78 Grove St., Hartford, Conn.

S. K. F. Ball Bearing Co., 50 Church St., New York, N. Y.
(See page 113.)

S.R.O.—See Marburg Bros.

SALISBURY Ball Bearing Co., 1276 E. Second St., Jamestown, N. Y.

SCHAFER—See Barthel & Daly.

SCHATZ Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.

STANDARD Machinery Co., Auburn, R. I.
(See page 713.)

STANDARD Roller Bearing Co., 50th St. & Lancaster Ave., Philadelphia, Pa.

SUSPENSION Bearing Co., Spartanburg, S. C.

TIGAR Bearings Co., M. George, 1876 Broadway, New York, N. Y. (Distributors.)
(See page 785.)

U. S. Ball Bearing Mfg. Co., Oak Park, Ill.
(See page 175.)

ROLLER BEARINGS

AMERICAN Roller Bearing Co., 416-20 Melwood Ave., Pittsburgh, Pa.

BALL & Roller Bearing Co., Danbury, Conn.
(See page 99.)

BOCK Bearing Co., Toledo, O.
(See Back Cover.)

BOWER Roller Bearing Co., Detroit, Mich.
(See page 359.)

GEORGE Automatic Roller Bearing Co., 4614 Spring Grove Ave., Cincinnati, O.

GRAHAM Roller Bearing Co., Coudersport, Pa.
(See page 401.)

GWILLIAM Co., 253 W. 58th St., New York, N. Y. (Distributors.)
(See page 679.)

HYATT Roller Bearing Co., 42 Hyatt Bldg., Detroit, Mich.
(See page 305.)

MAKUTCHAN Roller Bearing Co., 332 S. Michigan Ave., Chicago, Ill.

NORMA Co. of America, 1790 Broadway, New York, N. Y.
(See page 68.)

PENNSYLVANIA Shafting Co., Spring City, Pa. "Wright."

STANDARD Machinery Co., Auburn, R. I.
(See page 713.)

STANDARD Roller Bearing Co., 50th St. & Lancaster Ave., Philadelphia, Pa.

TIMKEN Roller Bearing Co., Canton, O.

WRIGHT—See Pennsylvania Shafting Co.

REGRINDING OF BALL BEARINGS

AHLBERG Bearing Co., 2644 Michigan Ave., Chicago, Ill.

AMERICAN Roller Bearing Co., 416-20 Melwood Ave., Pittsburgh, Pa.

BEARINGS Co. of Penn., 684 N. Broad St., Philadelphia, Pa.
(See page 287.)

DIENELT & Eisenhardt, 1304-18 N. Howard St., Philadelphia, Pa.

GWILLIAM Co., 253 W. 58th St., New York, N. Y.
(See page 679.)

PRUYN Ball Bearing Works, 4408-10 Paul St., Philadelphia, Pa.
(See page 839.)

PRUYN Co., David H., 1876 Broadway, New York, N. Y.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

Complete Index to Classification appears on Pages 8 to 27.

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American Made for American Trade

Are Stocked for immediate shipment at the factory or from any of the following

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ALBANY	Albany Hardware & Iron Co.,	
ATLANTA	Elyea-Austell Co.	
BALTIMORE	The Reus Bros. Co.	Mt. Royal Ave. & Cathedral S
BOSTON	Ahlberg Bearing Co.	93 Mass. Ave.
BUFFALO	Iroquois Rubber Co.	379-383 Washington St
CALGARY, ALB., CAN.	The Chapin Co.	
CHARLOTTE, N. C.	Chemi Company, Inc.	
CHICAGO	Ahlberg Bearing Co.,	2636 Michigan Ave.
	Chicago Pulley & Shafting Co.	32-36 S. Clinton St.
CINCINNATI	Herman Bumiller Co.,	432 Main St.
CLEVELAND	Ahlberg Bearing Co.,	1841 Euclid Ave.
	Cray Brothers,	1111 West 11th St.
DALLAS, TEXAS	Hans Johnsen,	1419 Commerce St.
DENVER	Denver Auto Goods Co.	1600 Broadway
	Quinn & McGill Motor Supply Co.,	1532 Broadway
	M. L. Foss,	1729 California St.
DES MOINES	Herring Motor Co.,	106-10th St.
DETROIT	Ahlberg Bearing Co.,	790 Woodward Ave.
EL PASO	Western Motor Supply Co.,	318 San Francisco Ave.
GALVESTON	Cummings & Co.,	302 23rd St.
HOUSTON, TEXAS	Houston Speedometer Service Sta. Co.	1212 Main St.
INDIANAPOLIS	H. T. Hearsey Co.,	339 No. Capitol Ave.
KANSAS CITY, MO.	Motor & Machinists Supply Co.	1519 Grand Ave.
LOS ANGELES	Ahlberg Bearing Co.,	325 W. Pico St.
	E. F. Merry,	900 S. Main St.
	Western Rubber & Supply Co.,	1011 S. Olive St.
MILWAUKEE	Julius Andrae & Sons Co.,	358 Broadway
MINNEAPOLIS	Hudson & Thurber Co.,	308 Third Ave. N.
NEW ORLEANS	Interstate Electric Co.,	Baronne and Perdido Sts.
NEW YORK CITY	Ahlberg Bearing Co.,	1790 Broadway
	The Gwilliam Co.,	Broadway and 58th St.
NORFOLK	Chemi Company, Inc.	438 Granby St.
OMAHA	The Lininger Implement Co.	6th and Pacific Sts
PASADENA	Western Rubber & Supply Co.	55 W. Colorado St.
PHILADELPHIA	The Gwilliam Co.,	1314 Arch St
PHOENIX, ARIZ.	Motor Supply Co.,	315 Central Ave.
PITTSBURGH	Machinists Supply Co.	
PORTLAND, ME.	James Bailey Co.,	18 Free St.
PORTLAND, ORE.	Ballou & Wright,	Broadway and Oak St.
RICHMOND, VA.	Chemi Company, Inc.,	639 E. Main St.
ROCHESTER	U. S. Rubber Co.,	24 Exchange St.
SACRAMENTO	Kimball-Upson Co.,	609-11 K St., 608-15 Oak Ave.
SAINT LOUIS	Ahlberg Bearing Co.,	2831 Locust St.
	Fred Campbell,	1109 and 3219 Locust St.
SALT LAKE CITY	Inter-Mountain Electric Co.,	43 East 4th St.
SAN ANTONIO TEX.	Woodward Carriage Co.,	Ave. C and 3rd St.
SAN FRANCISCO	E. F. Merry,	224 Van Ness Ave.
	Irvin Silverberg & Co.,	541 Van Ness Ave.
SAN JUAN, P. R	Pietrantoni & Sojo	
SEATTLE	Ballou & Wright,	817 E. Pike St.
SPOKANE	Child, Day & Churchill Co.,	1217 First Ave.
SYRACUSE	U. S. Rubber Co.,	212 S. Clinton St.
TACOMA	Automobile Supply Co., Inc.,	755 Broadway
TAMPA	American Supply Co.,	610-20 Tampa St.
TORONTO	The Tire Import Co.,	132-4 Simcoe St.
TUCSON, ARIZ.	Motor Supply Co.,	49 North 6th Ave.

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Bristol, Conn., U. S. A.

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DELTA-STAR Electric Co., 617-31 W. Jackson Blvd., Chicago, Ill.

LIBERTY Bell Co., Cleveland, O.

P. R. Mfg. Co., 621 Bellevue Ave., Detroit, Mich.

ROUSSEAU, David, Ossining, N. Y.

TRINITY Bell Electrical Mfg. Co., 306 W. Kinzie St., Chicago, Ill.

MECHANICAL BELLS OR GONGS

(For warning signal in place of horn)

BEVIN Bros. Mfg. Co., East Hampton, Conn.

EAST Hampton Bell Co., East Hampton, Conn.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

NEW Departure Mfg. Co., Bristol, Conn. (See page 101.)

NATIONAL Leather Mfg. Co., Niles, Mich.

NEW YORK Leather Belting Co., 465 Kent Ave., Brooklyn, N. Y.

NORWICH Belt Mfg. Co., Norwich, Conn.

PAGE Belting Co., Concord, N. H.

RAHMANN & Co., Geo., 31 Spruce St., New York, N. Y. "Comber."

RHOADS & Sons, J. E., 12 N. Third St., Philadelphia, Pa. "Tannate."

SCHIEREN Co., Chas. A., 30 Ferry St., New York, N. Y.

SHULTZ Belting Co., 402 Barton St., St. Louis, Mo. "Aqua."

TANNATE—See Rhoads & Sons.

TAYLOR Belting Co., 247 S. Meridian St., Indianapolis, Ind.

VIM—See Houghton & Co.

WEATHERHEAD-THOMPSON Co., Pawtucket, R. I.

WETPRUFE—See Hide, Leather & Belting Co.

WILLIAMS & Sons, I. B., Dover, N. H. "Cocheco."

BELTING

LEATHER BELTING

(See also Belts)

ADHESO—See Hide, Leather & Belting Co.

AMERICAN Belting & Tanning Co., 185 Oliver St., Boston, Mass.

AQUA—See Shultz Belting Co.

BONNER & Barnewell, 30 Church St., New York, N. Y.

BRADFORD Belting Co., 201 Walnut St., Cincinnati, O. "Monarch."

CHIBECO—See Chicago Belting Co.

CHICAGO Belting Co., 113-25 N. Green St., Chicago, Ill. "Chibeco."

CINO—See Mooney Belting Co.

COCHECO—See Williams & Sons.

COMBER—See Rahmann & Co.

ENDURMO—See Missouri Belting Co.

G & K—See Graton & Knight Mfg. Co.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K." (See page 103.)

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind. "Adheso," "Wetprufe." (See page 789.)

HOUGHTON & Co., E. F., 246 W. Somerset St., Philadelphia, Pa. "Vim."

HUDSON Belting Co., 1-8 Eaton Pl., Worcester, Mass.

JEWELL Belting Co., 55 Trumbull St., Hartford, Conn.

MISSOURI Belting Co., Grand Ave. & La Salle St., St. Louis, Mo. "Endurmo."

MONARCH—See Bradford Belting Co.

MOONEY Belting Co., 344 W. Sixth St., Cincinnati, O. "Cino."

NATIONAL Leather Belting Co., 342 E. 38th St., New York, N. Y.

BELTS

ENDLESS FABRIC BELTS

BROPHY Belting & Supply Co., Madison, Ind.

CURRY Co., J. W., 2615 Cummins St., Cincinnati, O.

FAIRMANCO—See Fairmont Mfg. Co.

FAIRMONT Mfg. Co. (Brighton Station), Cincinnati, O. "Fairmanco."

GEISEL, Otto E., 706 Chestnut St., Philadelphia, Pa. (See page 501.)

GILMER Co., L. H. (Tacony), Philadelphia, Pa. (See page 105.)

JOHNSON & Co., W. L., Endicott, N. Y.

LOCKWOOD & Dunlap, 1332 Addison Rd., Cleveland, O.

MODERN Belt & Web Co., Piper Bldg., Baltimore, Md.

RUSCO—See Russell Mfg. Co.

RUSSELL Mfg. Co., Middletown, Conn. "Rusco." (See page 811.)

STANDARD Woven Fabric Co., Walpole, Mass. (See pages 75 to 78.)

SPIRAL WIRE BELTS

BULL DOG—See N. Y. Wire & Spring Co.

CALCUTTS—See Gardner Wire Co.

EUREKA Spring Co., 347 W. Broadway, New York, N. Y.

GARDNER Wire Co., 5642 Race Ave., Chicago, Ill. "Calcutts."

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

HEBB, Geo. A., 70 William St., Newark, N. J.

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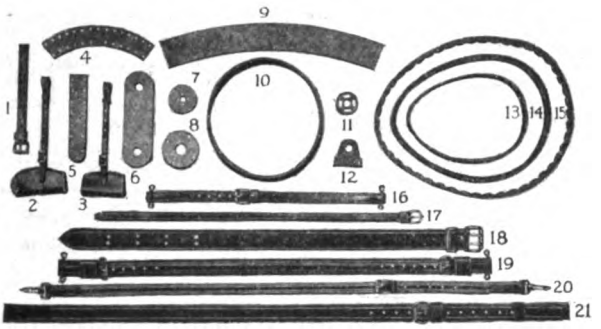

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3. Special Crank Holders.
4. Steering Wheel Covers.
5. Liners.
6. Leather Links.
7. Magneto Coupling Discs.
8. Magneto Coupling Discs.
9. Clutch Leathers—square end.
10. Clutch Leathers—endless.
11. Magneto Coupling Discs.
12. Special Washers.
13. Flat Fan Belts.
14. Solid "V" Fan Belts.
15. "V" Fan Belts — with blocks.
16. Back Top Straps.
17. Tire Straps.
18. Rebound Straps.
19. Hood Straps.
20. Front Top Straps.
21. Tail-board Straps.

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SPIRAL WIRE BELTS (Continued)

KELLEY, A. F., 178 S. Main St., Providence. R. I. "Kello."

KELLO—See Kelley, A. F.

MORGAN Spring Co., Worcester, Mass.

N. Y. Wire & Spring Co., 586-88 Washington St., New York, N. Y. "Bull Dog." (See page 789.)

WEBB Mfg. Co., ft. Center St., Newark, N. J. (See page 739.)

WILSON, Robert P., 20 Clinton St., Newark, N. J.

V BELTS

(For Flat Belts—See Belting, Leather)

ADHESO—See Hide, Leather & Belting Co.

ALGCO—See Auburn Leather Goods Co.

AUBURN Leather Goods Co., Auburn, N. Y. "Algco." (See page 309.)

BADGER Handle Co., 323 E. Water St., Milwaukee, Wis.

CHIBECO—See Chicago Belting Co.

CHICAGO Belting Co., 113-25 N. Green St., Chicago, Ill. "Chibeco."

CHICAGO Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.

COE & Brown, 202-04 George St., New Haven, Conn.

CRAIG Mfg. Co., Cedar Rapids, Ia.

DETROIT Leather Works, 141-43 E. Lafayette Blvd., Detroit, Mich. "Flexo." (See page 113.)

DUCKWALL Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind. (See page 409.)

FLEXO—See Detroit Leather Works.

GRATON & Knight Mfg. Co., Worcester, Mass. "Spartan." (See page 103.)

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind. "Wetprufe," "Adheso." (See page 789.)

KONTAK—See Rahmann & Co.

MESINGER Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

NATIONAL Leather Belting Co., 342 E. 38th St., New York, N. Y.

NATIONAL Leather Mfg. Co., Niles, Mich.

PAGE Belting Co., Concord, N. H.

RAHMANN & CO., Geo., 31 Spruce St., New York, N. Y. "Kontak."

RHOADS & Sons, J. E., 12 N. Third St., Philadelphia, Pa.

SCHIEREN Co., Chas. A., 30 Ferry St., New York, N. Y.

SPARTAN—See Graton & Knight Mfg. Co.

WAKEFIELD Sales Co., Trempealeau, Wis.

WETPRUFE—See Hide, Leather & Belting Co.

BENDINGS

WOOD BENDINGS

AUTO City Bow Co., Euclid Ave. E. & G. T. R. R., Detroit, Mich.

CAMPBELL & Dann Mfg. Co., Tullahoma, Tenn.

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

SHEPARD & Sons, H. G., James & River Sts., New Haven, Conn.

TOLEDO Bending Co., Toledo, O.

TUCKER Wood Work Co., Sidney, O.

WHEEL & Wood Bending Co., 141 John St., Bridgeport, Conn.

BINDING

MAT AND CARPET BINDING

DOUGLAS & Lomason Co., Detroit, Mich.

BINDINGS

UPHOLSTERY BINDINGS

BACKSTAY Machine & Leather Co., Oak & Howard Sts., Union City, Ind.

BAILEY Co., G. W., 127 Crescent St., Brockton, Mass.

BAUER Bros. Mfg. Co., 1035-37 Richmond St., Cincinnati, O.

BROCKTON Stay Co., 101 Belmont St., Brockton, Mass.

CARTER Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

CINCINNATI Welt Co., 118 Opera Pl., Cincinnati, O.

EDWARDS Mfg. Co., 216-20 Monroe Ave., Detroit, Mich.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

WADE Mfg. Co., 52 Haverhill St., Brockton, Mass.

WOODWARD & Cochey, 106 Sea St. Blvd., Lynn, Mass.

BLANKS

GEAR BLANKS

(See Gears, Blank)

BOARDS

DISPLAY BOARDS AND CASES

MARON Woodworking Co., 94 Chambers St., New York, N. Y.

RUNNING BOARDS

(See Steps, Special)

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AMERICAN Body Co., 1255-63 Niagara St., Buffalo, N. Y.

AMES Co., F. A., Owensboro, Ky.

ARMSTRONG-JOHNSTON Mfg. Co., W. First Ave. & Perry St., Columbus, O.

AUTO Body Co., Lansing, Mich.
(See page 107.)

AUTO Metal Co., 531 Worthington St., Springfield, Mass.
(See page 107.)

BEE Automobile Co., 15-21 N. Church St., Allentown, Pa.

BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

BOWE Carriage Co., 711 Orange St., Wilmington, Del.

BROWN Auto-Carriage Co., 3147 Superior Ave., Cleveland, O.

BUTLER Mfg. Co., 1324 Grand Ave., Kansas City, Mo.

CENTRAL Mfg. Co., 13th St. & Georgia Ave., Connersville, Ind.

COLLINS Carriage Co., Front & Arch Sts., Camden, N. J.

COLLINS Vehicle Woodwork Co., R. N., 3906 Chouteau Ave., St. Louis, Mo.

COMMERCIAL Auto Body & Mfg. Co., 5345 St. Clair Ave., Cleveland, O.

COOLING Carriage Co., 402 French St., Wilmington, Del.

DAYTON Body Co., 618-24 Geyer St., N., Dayton, O.

ERBY & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.

EUREKA—See Lally Commercial Body Co.

HAYES-IONIA Co., Ionia, Mich.

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

HIGHLAND Body Mfg. Co., 716 Elmwood Pl., Cincinnati, O.
(See page 111.)

IMPERIAL—See Welch & Suthergreen Co.

K-L—See Kingsbury-Leahy Co.

KAHLER Co., N. Vincennes St. & Monon R.R., New Albany, Ind.

KEYSTONE Vehicle Co., Reading, Pa.
(See page 107.)

KINGSBURY-LEAHY Co., 131-33 Hudson Ave., Albany, N. Y. "K-L."
(See page 107.)

LALLY Commercial Body Co., Paris St., Everett, Mass. "Perfection," "Eureka," "Paragon."

MACK Mfg. Co., Lancaster, Pa.

MARX, Geo. B., 198-204 Newell St., Brooklyn, N. Y.

MECKEL, Fred L., 9-13 E. 13th St., Chicago, Ill.

MERIDIAN Mfg. Co., Indianapolis, Ind.

METROPOLITAN Auto & Carriage Co., 430-34 Grand St., Bridgeport, Conn.

MIFFLINBURG Body & Gear Co., Mifflinburg, Pa.

MILLER & Co., A. J., Bellefontaine, O.

MONAHAN Vehicle Co., Kinsley Ave. & Eagle St., Providence, R. I.

NEW Haven Carriage Co., New Haven, Conn.
(See page 111.)

NILES Car & Mfg. Co., Erie St., Niles, O.

PARAGON—See Lally Commercial Body Co.

PERFECTION—See Lally Commercial Body Co.

PETERS Wagon & Auto Works, 418-20 Ensor St., Baltimore, Md.

ROBBINS & Co., Irvin, Indianapolis, Ind.
(See page 111.)

SARGENT & Ham Co., 26-30 Bowker St., Boston, Mass.

SCHILDWACHTER Carriage Co., Park Ave & 128th St., New York, N. Y.

SCHNABEL & Sons, G. A., 2410 Penn Ave., Pittsburg, Pa.

SCHOELER Bros., 247 Milwaukee Ave., Milwaukee, Wis.

SIOR & Son, Heinrich, 245-47 Floyd St., Brooklyn, N. Y.

SPRINGFIELD Body Co., Springfield, Mass.

STOVER Steel Tank & Mfg. Co., Hancock Ave., Freeport, Ill.

TROY Mfg. Co., Crawford St. & Big Four Ry., Troy, O.

VARIETY Mfg. Co., 340-52 N. Sacramento Blvd., Chicago, Ill.

WELCH & Suthergreen Co., 30 Lunenburg St., Fitchburg, Mass. "Imperial."

WERNER & Sons, Geo., 1133-37 Main St., Buffalo, N. Y.

WESTERN Auto-Body Mfg. Co., 416-18 E. Ninth St., Los Angeles, Cal.

WILLOUGHBY Co., Dwyer Ave. & Turner St., Utica, N. Y.

WRIGHT Carriage Body Co., Third Ave. & 24th St., Moline, Ill.

WRIGHT Co., Thomas, 71-73 Colden St., Jersey City, N. J.

YORK Wagon Gear Co., Linden & Belvidere Aves., York, Pa.

ZIMMERMAN & Sons, F. F., Main St., Waupun, Wis.

METAL PLEASURE CAR BODIES

ABRESCH Co., Chas., Fourth & Poplar Sts., Milwaukee, Wis.

AMERICAN Body Co., 1255-63 Niagara St., Buffalo, N. Y.

AMES Co., F. A., Owensboro, Ky.

ARMSTRONG Co., M., 483 Chapel St., New Haven, Conn.

AUTO Body Co., Lansing, Mich.
(See page 107.)

AUTO Metal Body Co., 346-52 Collins Ave., Pittsburgh, Pa.

AUTO Metal Co., 531 Worthington St., Springfield, Mass.
(See page 107.)

BARNES-CURTISS Co., 147-49 W. 99th St., New York, N. Y.

BEAUDETTE Co., O. J., Pontiac, Mich.

BIDDLE & Smart Co., Amesbury, Mass.

BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

BLUE Ribbon Auto & Carriage Co., 1720 Fairfield Ave., Bridgeport, Conn.

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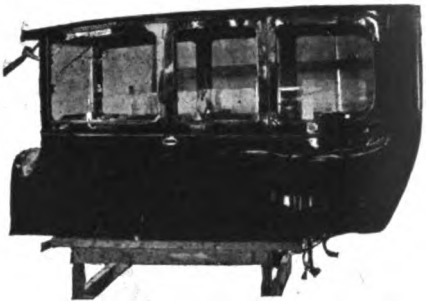

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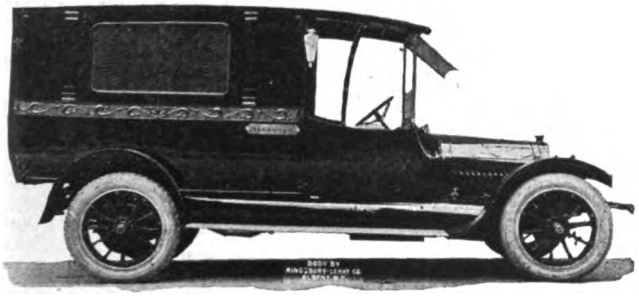

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BRIGGS Carriage Co., 11 Cedar St., Amesbury, Mass.

BRIGGS Mfg. Co., Clay Ave., Detroit, Mich.

BRUNN'S Carriage Mfg. Co., 1140-48 Main St., Buffalo, N. Y.

BRUNN & Co., 980 Ellicott St., Buffalo, N. Y.

BUDD Mfg. Co., Edward G., Hunting Park Ave. & 25th St., Philadelphia, Pa.

CAFFREY Co., Chas. S., Tenth & Market Sts., Camden, N. J.

CARRIAGE Woodstock Co., Owensboro, Ky.

CASTALUMINUM Body Co., Vermont & Stanley Sts., Detroit, Mich.

CENTRAL Mfg. Co., 18th St. & Georgia Ave., Connersville, Ind.

CLARK Carriage Co., Amesbury, Mass.

COLLINGS Carriage Co., Front & Arch Sts., Camden, N. J.

COLLINS Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.

COOLING Carriage Co., 402 French St., Wilmington, Del.

CUNNINGHAM Son & Co., James, 18 Canal St., Rochester, N. Y.

CURRIER-CAMERON Co., Amesbury, Mass.

CUTTER, J. Frank, 30 Amherst St., Cambridge, Mass.

DAYTON Body Co., 613-24 Geyer St., N., Dayton, O.

DEMAREST & Co., A. T., 453-67 Chapel St. New Haven, Conn.

DUNBAR Automobile Body Co., Filbert & 37th Sts., Philadelphia, Pa.

DUNHAM & Son., D. B., Central Ave. & Fourth St., Newark, N. J.

ERBY & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.

FARNHAM-NELSON Co., 47 Union Ave., Boston, Mass.

FISHER Body Co., St. Antoine St. & M. C. R. R., Detroit, Mich

FITZ GIBBON & Crisp, Calhoun St. & P. & R. R. R., Trenton, N. J. "Lion."

FLANDRAU & Co., 205 W. 75th St., New York, N. Y.

FLEETWOOD Metal Body Co., Fleetwood, Pa.

GRAVES & Co., G. O., Rahway, N. J.

GRISWOLD Motor & Body Co., 660 Commonwealth Ave., Detroit, Mich.

HALE & Kilburn Co., 18th St. & Glenwood Ave., Philadelphia, Pa.
(See page 109.)

HAYES-IONIA Co., Ionia, Mich.

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

HAYES & Miller Co., 518-22 E. 57th St., New York, N. Y.

HEALEY & Co., Broadway & 51st St., New York, N. Y.

HERBERT Mfg. Co., 570 Kirby Ave., W., Detroit, Mich.

HOLBROOK Co., West End Ave. & 67th St., New York N. Y.

HOLLANDER & Morrill, Amesbury, Mass.

JUDKINS Co., J. B., Merrimac, Mass.

KAHLER Co., N. Vincennes St. & Monon R. R., New Albany, Ind.

KEYSTONE Vehicle Co., Reading, Pa.
(See page 107.)

KIMBALL & Co., C. P., Chicago, Ill.
(See page 129.)

KINGSBURY-LEAHY Co., 131-33 Hudson Ave., Albany, N. Y.
(See page 107.)

KRESSLER Auto Co., Fostoria, O.

LIMOUSINE-CARRIAGE Mfg. Co., 3515 Michigan Ave., Chicago, Ill.

LION—See Fitz Gibbon & Crisp.

LOCKE & Co., 213-20 W. 34th St., New York, N. Y.

MAC INNIS Bros., 118-22 22d St., Toledo, O.

MERIDIAN Mfg. Co., Indianapolis, Ind.

MACK Mfg. Co., Lancaster, Pa.

MIFFLINBURG Body & Gear Co., Mifflinburg, Pa.

MILBURN Wagon Co., 3134 Monroe St., Toledo, O.

MILLER Bros., Chestnut St., Amesbury, Mass.

MILLER & Co., A. J., Bellefontaine, O.

MILLER, Hicks & Hewitt, 509-15 W. 56th St., New York, N. Y.

MONROE Body Co., Osmun St., Pontiac, Mich.

MOUNT Co., J. W., Maple Ave. & White St., Red Bank, N. J.

MULLINS Co., W. H., 182 Franklin St., Salem, O.

NEW HAVEN Carriage Co., New Haven, Conn.
(See page 111.)

PETTINGELL Machine Co., 79 Elm St., Amesbury, Mass.

PORTLAND Body Works, Portland, Ind.

PULLAR Co., James, 5 Mechanic St., Hartford, Conn.

QUINBY & Co., J. M., 21-39 Division St., Newark, N. J.

R. & H. Sheet Metal Co., 109 Center Ave., Abington, Mass.

RACINE Mfg. Co., Racine, Wis.
(See page 113.)

ROBBINS & Co., Irvin, Indianapolis, Ind.
(See page 111.)

SARGENT & Ham Co., 26-28 Bowker St., Boston, Mass.

SCHILDWACHTER Carriage Co., Park Ave. & 128th St., New York, N. Y.

SEAMAN Co., W. S., 486 Virginia St., Milwaukee, Wis.

SPRINGFIELD Body Co., Springfield, Mass.

SIDNEY Mfg. Co., Sidney, O.

STEWART Co., W. F., Harriet St., Flint, Mich.

THOMPSON Co., E. J. (Forbes Field), Pittsburg, Pa.

TROY Mfg. Co., Crawford St. & Big Four Ry., Troy, O.

UNION CITY Body Co., Union City, Ind.

WALKER Carriage Co., Merrimac, Mass.

WALKER-WELLS Co., Amesbury, Mass.

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WESTERN Auto-Body Mfg. Co., 416-18 E. Ninth St., Los Angeles, Cal.

WILLOUGHBY Co., Dwyer Ave. & Turner St., Utica, N. Y.

WILSON Body Co., C. R., Clay Ave. & Grand Trunk R. R., Detroit, Mich.

WOOP Co., Wm., 136 W. 52d St., New York, N. Y.

WRIGHT Carriage Body Co., Third Ave. & 24th St., Moline, Ill.

YORK Wagon Gear Co., Linden & Belvidere Aves., York, Pa.

ZIMMERMAN & Sons, F. F., Main St., Waupun, Wis.

WOOD COMMERCIAL CAR BODIES

ABRESCH Co., Chas., Fourth & Poplar Sts., Milwaukee, Wis.

ALBERT Bros., 11-13 Cannon St., New York, N. Y.

AMERICAN Body Co., 1255-63 Niagara St., Buffalo, N. Y.

AMERICAN Wagon Co., Dixon, Ill.

AMES Co., F. A., Owensboro, Ky.

ANDERSON Motor Co., Rock Hill, S. Car.

ARMSTRONG-JOHNSTON Mfg. Co., W. First Ave. & Perry St., Columbus, O.

AUBURN Wheel & Mfg. Co., Auburn, R. I.

AUTO Body Co., Lansing, Mich.
(See page 107.)

AUTO Body Works, 1227 Broadway, Nashville, Tenn.

AUTO Metal Co., 531 Worthington St., Springfield, Mass.
(See page 107.)

BAILEY Mfg. Co., North Wales, Pa.

BAILEY & Bowne, Lafayette & Wiley Sts., Utica, N. Y.

BALDWIN & Son, D. W., 366 Crown St., New Haven, Conn.

BARRETT Mfg. Co., Peter, 111 Navy St., Brooklyn, N. Y.

BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

BLUE Ribbon Auto & Carriage Co., 1720 Fairfield Ave., Bridgeport, Conn.

BOLLWERK & Bro., H., 3103 S. Broadway, St. Louis, Mo.

BORBEIN Auto Co., 2109-11 N. Ninth St., St. Louis, Mo.

BOWE Carriage Co., 711 Orange St., Wilmington, Del.

BRILL Co., J. G., 62d St. & Woodland Ave., Philadelphia, Pa.

BROWN Auto-Carriage Co., 3147 Superior Ave., Cleveland, O.

BROWNELL & Burt, 12 Washington St., Taunton, Mass.

CENTRAL Auto Body Co., 15 Orchard St., Hartford, Conn.

CHARLOTTE Wagon & Auto Co., 26 E. Sixth St., Charlotte, N. Car.

CHICAGO Carriage & Trimming Co., 3514-20 S. Michigan Ave., Chicago, Ill.

CINCINNATI Panel Co., 1938-48 W. Eighth St., Cincinnati, O.

COLLINS Carriage Co., Front & Arch Sts., Camden, N. J.

COLLINS Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.

COLUMBIA Wagon Co., Columbia, Pa.

COMMERCIAL Auto Body Co., St. Louis, Mo.

COMMERCIAL Auto Body & Mfg. Co., 5345 St. Clair Ave., Cleveland, O.

COOLING Carriage Co., 402 French St., Wilmington, Del.

COPE Co., 1082-84 Clinton Ave., Irvington, N. J.

CURRIER-CAMERON Co., 35 Elm St., Amesbury, Mass.

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

DAYTON Body Co., 618-24 Geyer St., N., Dayton, O.

DONEGAN Auto Body & Specialty Co., 338 Trumbull St., Hartford, Conn.

DONIGAN & Nielson, 743-47 Third Ave., Brooklyn, N. Y.

ECONOMY Mfg. Co., 207 W. South St., Indianapolis, Ind.

ERBY & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.

EUREKA—See Lally Commercial Body Co.

FISHER, A., 300-10 Fort St., W., Detroit, Mich.

FITZ GIBBON & Crisp, Calhoun St. & P. & R. R. R., Trenton, N. J. "Lion."

FULTON-WALKER Co., 20th & Filbert Sts., Philadelphia, Pa.

GEISSEL & Sons, A., 485-87 N. Third St., Philadelphia, Pa.

GOLIDE, Louis, 1874 W. 22d St., Cleveland, O.

HABERER & Co., Cincinnati, O.
(See page 585.)

HIGHLAND Body Mfg. C.o, 716 Elmwood Pl., Cincinnati, O.
(See page 111.)

HOOVER Wagon Co., York, Pa.
(See page 587.)

IMPERIAL—See Welch & Suthergreen Co.

IRVING Co., Geo., Hanover, Pa.

JEWETT Co., Geo. H., 172-74 Shrewsbury St., Worcester, Mass.

K-L—See Kingsbury-Leahy Co.

KIDNEY Co., James, Cincinnati, O.

KINGSBURY-LEAHY Co., 131-33 Hudson Ave., Albany, N. Y. "K-L."
(See page 107.)

KIPP Wagon Co., 222 E. 24th St., New York, N. Y.

KLINGER Bros. Co., 50 Fulton St., Brooklyn, N. Y.

KOENIG & Luhrs Wagon Co., Quincy, Ill.

LALLY Commercial Body Co., Paris St., Everett, Mass. "Perfection," "Eureka," "Paragon."

LANGE Wagon Co., H., S. St. Clair & Eva Sts., E. E., Pittsburg, Pa.

LEAMAN Co., John M., 680-84 National Ave., Milwaukee, Wis.

LEONHARDT Wagon Mfg. Co., 412-20 E. Saratoga St., Baltimore, Md.

Complete Index to Classification appears on Pages 3 to 27.

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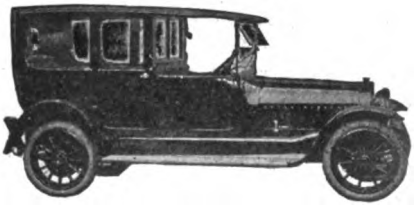

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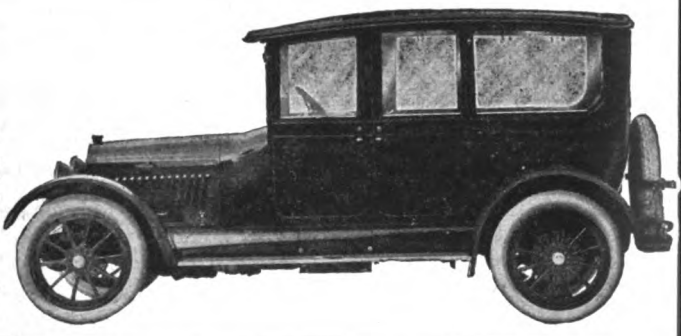

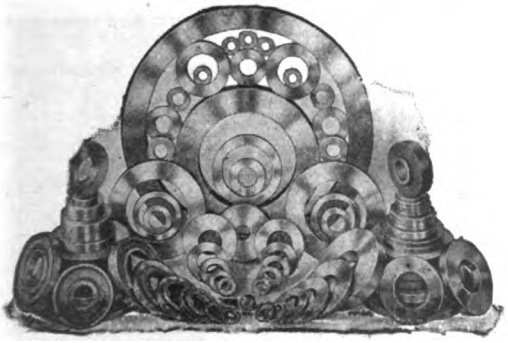

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BODIES (Continued)

WOOD COMMERCIAL CAR BODIES (Continued)

LION—See Fitz Gibbon & Crisp.

LOWELL Auto Body Co., Lowell Mich.

McCARDELL & Co., J. R., S. Warren & Mill Sts., Trenton, N. J.

MACK Mfg. Co., Lancaster, Pa.

MARTIN Carriage Works, York, Pa. (See page 587.)

MERTZ Co., 704-08 Woodland Ave., Cleveland, O.

METROPOLITAN Auto & Carriage Co., 430-34 Grand St., Bridgeport, Conn.

MIFFLINBURG Body & Gear Co., Mifflinburg, Pa.

MILBURN Wagon Co., 1134 Monroe St., Toledo, O.

MILLER Co., E. M., Quincy, Ill.

MONAHAN Vehicle Co., Kinsley Ave. & Eagle St., Providence, R. I.

MOTOR Truck Body Co., 611 Central Ave., Detroit, Mich.

MOUNT Co., J. W., Maple Ave. & White St., Red Bank, N. J.

MULHOLLAND Co., Washington Ave., Dunkirk, N. Y.

NEW Haven Carriage Co., New Haven, Conn. (See page 111.)

NEW Ideal Wagon Works, 1845 Park Ave., New York, N. Y.

NIEDERHUT Carriage Co., 3556-62 Walnut St., Denver, Colo.

OETTINGER Wagon Co., Greensboro, N. C.

PARAGON—See Lally Commercial Body Co.

PARRY Mfg. Co., 110 Parry Ave., Indianapolis, Ind. (See page 589.)

PATERSON Vehicle Co., 257-59 Market St., Paterson, N. J.

PERFECTION—See Lally Commercial Body Co.

PETERS Wagon & Auto Works, 418-20 Ensor St., Baltimore, Md.

RECH-MARBAKER Co., Eighth St. & Girard Ave., Philadelphia, Pa.

ROBBINS & Co., Irvin, Indianapolis, Ind. (See page 111.)

ROEDER Mfg. Co., Fred., 846-72 Grand St., Brooklyn, N. Y.

SARGENT & Ham Co., 26-30 Bowker St., Boston, Mass.

SCHAEFER Wagon Co., Gustav, 4166-80 Lorain Ave., Cleveland, O.

SCHALL, Anton, 402-07 Flushing Ave., Brooklyn, N. Y.

SCHILDWACHTER Carriage Co., Park Ave. & 128th St., New York, N. Y.

SCHMITZ & Bro., Geo., 666-68 Genesee St., Buffalo, N. Y.

SCHNABEL & Sons, G. A., 2410 Penn Ave., Pittsburg, Pa.

SCHOELER Bros., 247 Milwaukee Ave., Milwaukee, Wis.

SCHUBERT Wagon Co., August, Oneida, N. Y.

SCHUKRAFT & Sons, Wm., 932-43 Fulton St., Chicago, Ill.

SEBASTIAN Wagon Co., 425 E. 53d St., New York, N. Y.

SHADBOLT Mfg. Co., Flushing Ave. & Cumberland St., Brooklyn, N. Y.

SMITH Carriage Co., R. J., Lake & Lyell Aves., Rochester, N. Y.

STUNKARD Bros. Buggy Co., 24-26 N. Meridian St., Brazil, Ind.

STURTEVANT-LARRABEE Co., 10-16 Charles St., Binghamton, N. Y.

TEGETMEIER & Riepe Co., 771-73 First Ave., New York, N. Y.

TOPFORD Co., 112-16 Grove St., Hempstead, N. Y.

TRIPPENSEE Mfg. Co., 2678 E. Grand Blvd., Detroit, Mich.

TROY Mfg. Co., Crawford St. & Big Four Ry., Troy, O.

UHLENHAUT Bros. Wagon Co., 1322-24 Merchant St., St. Louis, Mo.

UNION Wheel Works, 51-55 Stanton St., Newark, N. J.

VON DOMARUS Sons Co., Geo., 347-55 Larrabee St., Chicago, Ill.

WALKER Carriage Co., Merrimac, Mass.

WARNSMANN, Henry, 4108 Clark Ave., Cleveland, O.

WAVERLEY Co., 129 S. East St., Indianapolis, Ind.

WEBER Co., O. M., North Wales, Pa.

WELCH & Suthergreen Co., 80 Lunenburg St., Fitchburg, Mass. "Imperial."

WERNER & Sons, Geo., 1133-37 Main St., Buffalo, N. Y.

WESTERN Auto-Body Mfg. Co., 416-18 E. Ninth St., Los Angeles, Cal.

WILLIAMSON, Sam, 1800 Texas St., El Paso, Texas.

WILLOUGHBY Co., Dwyer Ave. & Turner St., Utica, N. Y.

WRIGHT Carriage Body Co., Third Ave. & 24th St., Moline, Ill.

WRIGHT Co., Thomas, 71-78 Colden St., Jersey City, N. J.

YORK Carriage Co., Franklin & Hay Sts., York, Pa.

YORK Wagon Gear Co., Linden & Belvidere Aves., York, Pa.

ZIMMERMAN & Sons, F. F. Main St., Waupun, Wis.

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ABRESCH Co., Chas., Fourth & Poplar Sts., Milwaukee, Wis.

AMERICAN Body Co., 1255-63 Niagara St., Buffalo, N. Y.

AMES Co., F. A., Owensboro, Ky.

ARMSTRONG Co., M., 433 Chapel St., New Haven, Conn.

ARMSTRONG-JOHNSTON Mfg. Co., W. First Ave. & Perry St., Columbus, O.

AUTO Body Co., Lansing, Mich. (See page 107.)

AUTO Body Works, 1227 Broadway, Nashville, Tenn.

AUTO Metal Co., 531 Worthington St., Springfield, Mass. (See page 107.)

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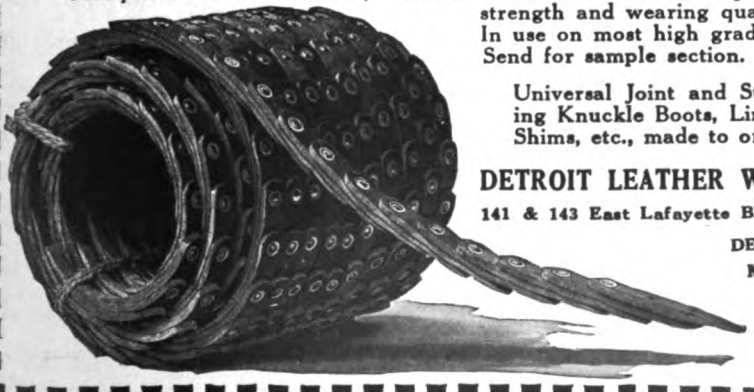

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BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

BLUE Ribbon Auto & Carriage Co., 1720 Fairfield Ave., Bridgeport, Conn.

BORBEIN Auto Co., 2109-11 N. Ninth St., St. Louis, Mo.

BOWE Carriage Co., 711 Orange St., Wilmington, Del.

BREWSTER & Co., Queensboro Bridge Plaza, Long Island City, N. Y.

BROWNELL & Burt, 12 Washington St., Taunton, Mass.

BRUNN'S Carriage Mfg. Co., 1140-48 Main St., Buffalo, N. Y.

BRUNN & Co., 980 Ellicott St., Buffalo, N. Y.

CENTRAL Auto Body Co., 15 Orchard St., Hartford, Conn.

CHICAGO Carriage & Trimming Co., 3514-20 S. Michigan Ave., Chicago, Ill.

CHICAGO Coach & Carriage Co., 1233-31 S. Michigan Ave., Chicago, Ill.

COLLINGS Carriage Co., Front & Arch Sts., Camden, N. J.

COLLINS Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.

COOLING Carriage Co., 402 French St., Wilmington, Del.

CUNNINGHAM Son & Co., James, 18 Canal St., Rochester, N. Y.

CURRIER-CAMERON Co., 35 Elm St., Amesbury, Mass.

DANN Bros. & Co., 30-38 Franklin St., New Haven, Conn.

DAYTON Body Co., 618-24 Geyer St., N., Dayton, O.

DEMAREST & Co., A. T., 453-67 Chapel St., New Haven, Conn.

DUNBAR Automobile Body Co., Filbert & 37th Sts., Philadelphia, Pa.

EARL Automobile Works, 1320 S. Main St., Los Angeles, Cal.

ERBY & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.

ERDMAN-GUIDER Co., 2290 Woodward Ave., Detroit, Mich.

FARNHAM-NELSON Co., 47 Union Ave., Boston, Mass.

FEHRING Carriage Co., 601-09 Third St., Columbus, Ind.

FISHER, A., 300-10 Fort St., W., Detroit, Mich.

FITZ GIBBON & Crisp, Calhoun St. & P. & R. R. R., Trenton, N. J. "Lion."

FLANDRAU & Co., 305 W. 75th St., New York, N. Y.

GRAVES & Co., G. O., Rahway, N. J.

GREGG-WM. D. ROGERS Co., 1926 Arch St., Philadelphia, Pa.

HABERKORN & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

HAYES & Miller Co., 518-22 E. 57th St., New York, N. Y.

HEALEY & Co., Broadway & 51st St., New York, N. Y.

HOLCKER-ELBERG Mfg. Co., 16th & McGee Sts., Kansas City, Mo.

HUGHEY & Son, Wm. J., 2518-20 Michigan Ave., Chicago, Ill.

KIMBALL & Co., C. P., Chicago, Ill. (See page 129.)

KINGSBURY-LEAHY Co., 131-33 Hudson Ave., Albany, N. Y. (See page 107.)

LIMOUSINE-CARRIAGE Mfg. Co., 3515 Michigan Ave., Chicago, Ill.

LION—See Fitz Gibbon & Crisp.

LOCKE & Co., 218-20 W. 84th St., New York, N. Y.

MAC INNIS Bros., 118-22 22d St., Toledo, O.

MACK Mfg. Co., Lancaster, Pa.

MANHATTAN Auto Top & Body Co., 221-23 W. 64th St., New York, N. Y.

MANN-ALDRICH Carriage Co., 1300 Lincoln St., Denver, Colo.

MARTIN Carriage Works, York, Pa. (See page 587.)

MAYER, John M., Kingston, N. Y.

MECKEL, Fred L., 9-13 E. 18th St., Chicago, Ill.

MERIDIAN Mfg. Co., Indianapolis, Ind.

MIFFLINBURG Body & Gear Co., Mifflinburg, Pa.

MONROE Body Co., Osmun St., Pontiac, Mich.

MOUNT Co., J. W., Maple Ave. & White St., Red Bank, N. J.

NEW Haven Carriage Co., New Haven, Conn. (See page 111.)

PATTERSON Auto Carriage Co., 2261 E. 14th St., Cleveland, O.

RECH-MARBAKER Co., Eighth St. & Girard Ave., Philadelphia, Pa.

REX Buggy Co., Connersville, Ind.

SARGENT & Ham Co., 26-30 Bowker St., Boston, Mass.

SCHILDWACHTER Carriage Co., Park Ave. & 128th St., New York, N. Y.

SEAMAN Co., W. S., 486-90 Virginia St., Milwaukee, Wis.

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SOUTH Bend Spring Wagon & Carriage Co., 210-16 S. St. Joseph St., South Bend, Ind.

STONE & Sons, C., 1658-74 Ogden Ave., Chicago, Ill.

SWAN Demountable Body Co., 4021 Payne Ave., Cleveland, O.

TERRILL Bros., Hamilton & Church Sts., Rahway, N. J.

TROY Mfg. Co., Crawford St. & Big Four Ry., Troy, O.

UNION City Body Co., Union City, Ind.

VON DOMARUS Sons Co., Geo., 347-55 Larrabee St., Chicago, Ill.

WALKER Carriage Co., Merrimac, Mass.

Complete Index to Classification appears on Pages 8 to 27.

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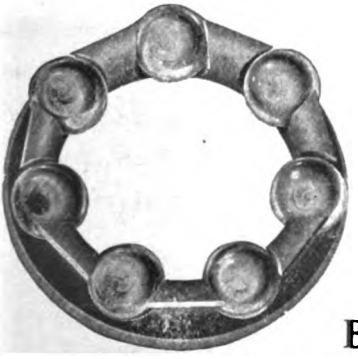

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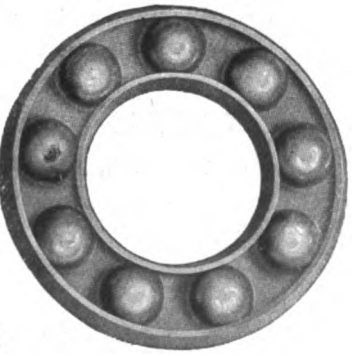

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HEIL Co., 26th & Montana Aves., Milwaukee, Wis.

LALLY Commercial Body Co., Paris St., Everett, Mass.

LEE Loader Co., Chicago, Ill.

LION—See Fitz Gibbon & Crisp.

LITTLEFORD Bros., 453-57 E. Pearl St., Cincinnati, O.

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PRESS Sons, Jacob, Fulton & Halsted Sts., Chicago, Ill.

SHADBOLT Mfg. Co., Flushing Ave. & Cumberland St., Brooklyn, N. Y.

SIOR & Son, Heinrich, 245-47 Floyd St., Brooklyn, N. Y.

WRIGHT Co., Thomas, 71-73 Colden St., Jersey City, N. J.

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STEAM Carriage Boiler Co., 130 W. First St., Oswego, N. Y.

BOLTS

CAP BOLTS

(See Screws, Cap and Set)

CARRIAGE BOLTS

(See Bolts, Machine and Carriage)

MACHINE AND CARRIAGE BOLTS

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

CLARK Bros. Bolt Co., Milldale, Conn. (See page 119.)

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

DETROIT Screw Works, Detroit, Mich. (See page 849.)

EAGLE— See Skelly Bolt Co.

FALLS Rivet Co., Kent, O.

GRAHAM Nut Co., 1317-19 W. Carson St., Pittsburg, Pa.

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

HAYDON, A. & M., 304 N. 22d St., Philadelphia, Pa.

KANSAS City Bolt & Nut Co. (Sheffield Station), Kansas City, Mo.

KIRK-LATTY Mfg. Co., Madison Ave., Cleveland, O.

LAMSON & Sessions Co., 2133 Scranton Rd. Cleveland, O.

LANZ & Sons, Mathew, 2907 Carson St., Pittsburg, Pa.

NATIONAL Lock Co., Seventh St. & 19th Ave., Rockford, Ill.

NATIONAL Screw & Tack Co., Cleveland O. (See page 119.)

OLIVER Iron & Steel Co., Pittsburg, Pa.

PAWTUCKET Mfg. Co., 327 Pine St., Pawtucket, R. I.

PITTSBURG Screw & Bolt Co., Preble Ave (N. S.), Pittsburg, Pa.

REPUBLIC Iron & Steel Co., Republic Bldg Youngstown, O.

RHODE Island Tool Co., Providence, R. I.

RUSSELL, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SHELTON Co., Shelton, Conn.

SKELLY Bolt Co., Thomas P., 24th & Callowhill Sts., Philadelphia, Pa. "Eagle."

UPSON Nut Co., Scranton Rd., Cleveland, O.

SPRING AND SHACKLE BOLTS

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CLARK Bros. Bolt Co., Milldale, Conn. (See page 119.)

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

FERRY Cap & Set Screw Co., 2151 Scranton Rd., Cleveland, O.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O. (See page 845.)

FOSTORIA Screw Co., Fostoria, O.

PHILLIPS Mfg. Co., R. B., Worcester, Mass.

STEEL Products Co., Cleveland, O. (See page 296.)

WINKLEY Co., Detroit, Mich. (See page 203.)

ZERK Mfg. Co., Cleveland, O.

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EMPRESS
OIL AND GREASE CUPS

No. 222

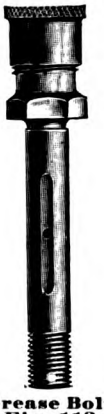
Spring Compression Fig. 215

Invisible Ratchet Fig. 233

Marine Fig. 213

No. 5739

Short Pat. Marine Fig. 220

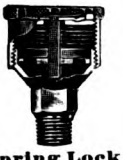

Grease Bolt Fig. 112

Grease Bolt Fig. 111

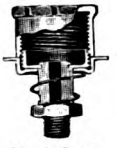
Oil Bolt Fig. 113

DeLuxe Fig. 232

Plain Fig. 200


Spring Lock Fig. 203

Wire Lock Fig. 205


Ratchet Fig. 209

Wing Top Ratchet Fig. 210

Leather Packed Fig. 207

Outside Lock Fig. 224

Style "K" Fig. 54

Style "N" Fig. 53

Style "D" Fig. 52

Style "B" Fig. 51

Style "A" Fig. 50

Style "L" Fig. 55

Style "C" Fig. 56

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AMERICAN Screw Co., 21 Stevens St., Providence, R. I.

ATLAS Bolt & Screw Co., 1239 Marquette Rd., N. E., Cleveland, O.

CLARK Bros. Bolt Co., Milldale, Conn. (See page 119.)

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

FALLS Rivet Co., Kent, O.

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

KIRK-LATTY Mfg. Co., Madison Ave., Cleveland, O.

LAMSON & Sessions Co., 2188 Scranton Rd., Cleveland, O.

NATIONAL Lock Co., Seventh St. & 19th Ave., Rockford, Ill.

NATIONAL Screw & Tack Co., Cleveland, O. (See page 119.)

PAWTUCKET Mfg. Co., 827 Pine St., Pawtucket, R. I.

READING Screw Co., Norristown, Pa.

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

RUSSELL & Erwin Mfg. Co., New Britain, Conn.

RUSSELL, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

UPSON Nut Co., Scranton Rd., Cleveland, O.

TIRE BOLTS

(See Bolts, Stove and Tire)

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(See Hoods, Motor)

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(See Pans, Dust)

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ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. (See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y. (See page 205.)

BAILEY Co., R. B., 406 W. Pico St., Los Angeles, Cal.

BAUER-LEWIS Co., 863 Holden Ave., Detroit, Mich.

CAMPBELL—See Perkins-Campbell Co.

ECONOMY Stay Co., Jefferson City, Mo.

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

GIVEN & Son Co., R., Sidney, O.

HAGER & Son, Chas., 1876 Broadway, New York, N. Y.

HANISCH Sons, R., 121-23 N. Halsted St., Chicago, Ill.

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind. (See page 789.)

HOOVER Co., W. H., New Berlin, O.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill. "Niehoff."

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

NIEHOFF—See Nemo Chemical & Specialty Mfg. Co.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 207.)

REINHOLD Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

SMITH & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.

STEVENS & Bro., A. A., 1234 Wabash Ave., Chicago, Ill.

SUTHERLAND Co., F. L., 189 Beaubien St., Detroit, Mich. (See page 813.)

WILEY & Son Co., Wm. H., 80 Pliny St., Hartford, Conn.

BOWS

TOP BOWS

AUTO City Bow Co., Euclid Ave., E. & G. T. R. R., Detroit, Mich.

BROWN & Co., S. N., 111 Commercial St., Dayton, O.

CAMPBELL & Dann Mfg. Co., Tullahoma, Tenn.

CONESTOGA Bending Works, 545 N. Market St., Lancaster, Pa.

DANN Bros. & Co., 30-38 Franklin St., New Haven, Conn.

DELPHOS Bending Co., Delphos, O.

DETROIT Bow Co., Dubois & Guoin Sts., Detroit, Mich.

DETROIT Wood Pulley Co., 1831-37 Bellevue Ave., Detroit, Mich.

EMPIRE Bending Works, 110 S. Christian St., Lancaster, Pa.

LEBZELTER & Son Co., Philip, Lancaster, Pa. (See page 843.)

MILLIKEN, Geo. W., Muncie, Ind.

MOSSMAN, Yarnelle & Co., Pearl St. & Maiden Lane, Fort Wayne, Ind.

MYCO—See Wayne Spoke & Bending Works.

SCHERER & Co., H., Detroit, Mich.

Complete Index to Classification appears on Pages 8 to 27.

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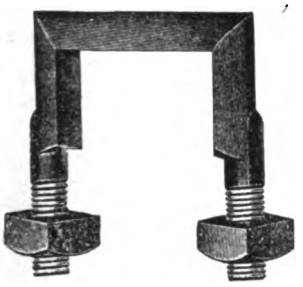
Automobile Spring Clips



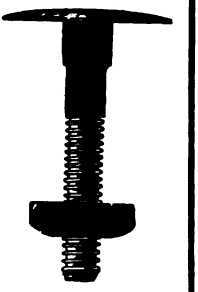
MANUFACTURERS OF AUTOMOBILE HARDWARE

We make a specialty of

SPRING CLIPS, STEP BOLTS, BLANK TEE BOLTS, YOKE AND ROD ENDS, BODY AND TOP IRONS, FENDER RIVETS, BOLTS, NUTS AND WASHERS.

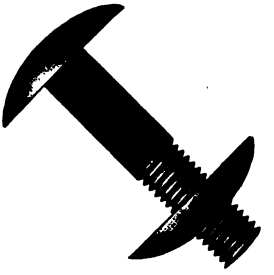
Special Automobile forgings made to blueprint or carried in stock.

THE COLUMBUS BOLT WORKS CO.
COLUMBUS, OHIO



Step Bolt

Automobile Bolts
Machine Bolts
Carriage Bolts
Body Bolts
Wheel Bolts
Nuts, Rivets,
Washers, Screws,
Made of Special
Steels.



Established 1854

Factory:
Milldale, Conn.

CLARK BROS. BOLT CO. MILLDALE, CONN.

TRADE MARK

FORGED STEEL WING NUTS

SQUARE NECK CARRIAGE BOLTS.

SCREWS — WOOD
MACHINE
COACH

BOLTS — AUTO. WHEEL
CARRIAGE
MACHINE
STEP
STOVE
RIBBED NECK

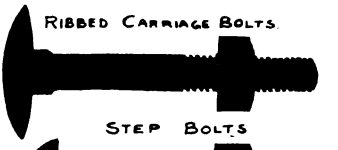
RIVETS

COTTERS

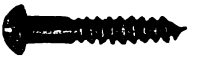
NUTS — SQUARE
HEXAGON
SEMI FINISHED
FULL FINISHED

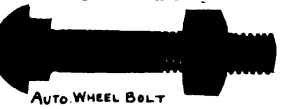
SPRING COTTER PINS

RIBBED CARRIAGE BOLTS.



STEP BOLTS





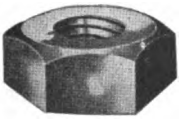
AUTO. WHEEL BOLT

WOOD SCREWS

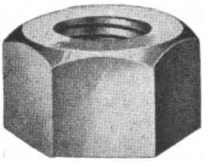
ALL KINDS OF SPECIAL BOLTS NUTS OR SCREWS. SEND SAMPLE FOR PRICE

CATALOG ON REQUEST

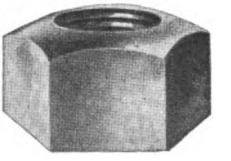
WE SOLICIT YOUR INQUIRES.



JAM NUTS



STANDARD HEX. NUTS



FINISHED CASE HARDENED

THE NATIONAL SCREW AND TACK CO.
CLEVELAND, OHIO

CHICAGO OFFICE
204 MACHINERY HALL

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BOWS (Continued)

TOP BOWS (Continued)

SHEPARD & Sons, H. G., James & River Sts., New Haven, Conn.

STARR, D. H., Highland, N. Y.

TOLEDO Bending Co., Toledo, O.

UNION Bow Co., 725-35 Superior Ave., N. W., Cleveland, O.

WAYNE Spoke & Bending Works, Fort Wayne, Ind. "Myco."

WAYNE Steering Wheel & Bow Co., Wayne, Mich.

WHEEL & Wood Bending Co., 141 John St., Bridgeport, Conn.

BOXES

FARE BOXES

CAILLE Bros. Co., Detroit, Mich.

JITNEY Fare Box Co., 5314 St. Clair Ave., Cleveland, O.

METAL BATTERY BOXES

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

CORNWALL Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O. (See page 739.)

DETROIT Auto Specialty Co., 900-11 Greenwood Ave., Detroit, Mich.

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O. (See page 121.)

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

HUNT & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

SLY Mfg. Co., W. W., Cleveland, O.

STANDARD Steel Box Co., Bridgeville, Pa.

VICTOR Auto Parts Co., Second & Elm Sts., Cincinnati, O.

WOOD BATTERY BOXES

(See also Holders, Battery)

AMERICAN Body Co., 1255-63 Niagara St., Buffalo, N. Y.

BLAKELEY, W. W., 100 Leicester Ct., Detroit, Mich.

CHURCHILL Cabinet Co., 2119 Churchill St., Chicago, Ill.

KARREMAN Co., Grand Rapids, Mich.

STANDARD Cabinet Mfg. Co., Peru, Ind.

TOLLNER'S Sons Co., Chas., Pulaski, N. Y.

WEST Box Co., F. M., 225 Liberty St., Springfield, Mass.

SPARK COIL BOXES

BUBECK & Guerin, 161-63 W. 18th St., New York, N. Y.

CHURCHILL Cabinet Co., 2119 Churchill St., Chicago, Ill.

HABERKORN & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

KARREMAN Co., Grand Rapids, Mich.

STANDARD Cabinet Mfg. Co., Peru, Ind.

WABASH Cabinet Co., Wabash, Ind.

WEST Box Co., F. M., 225 Liberty St., Springfield, Mass.

METAL TOOL BOXES

(For Tool Bags—See Bags, Tool)

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

CORNWALL Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O. (See page 739.)

DETROIT Auto Specialty Co., 900-11 Greenwood Ave., Detroit, Mich.

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O. (See page 121.)

GRAY Specialty Co., 148 Avon Ave., Newark, N. J.

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, Ohio. "Lawco." (See page 617.)

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MITCHELL & Sons, G. F., 6501 Cedar Ave., Cleveland, O.

STANDARD Steel Box Co., Bridgeville, Pa.

VICTOR Auto Parts Co., Second & Elm Sts., Cincinnati, O.

WOOD TOOL BOXES

(For Tool Bags—See Bags, Tool)

AMERICAN Body Co., 1255-63 Niagara St., Buffalo, N. Y.

HABERKORN & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

STANDARD Cabinet Mfg. Co., Peru, Ind.

TOLLNER'S Sons Co., Chas., Pulaski, N. Y.

WEST Box Co., F. M., 225 Liberty St., Springfield, Mass.

BRACKETS

AUTOMATIC HEADLIGHT BRACKETS

AUTOMATIC Control Co., 416-22 E. First St., Dayton, O. "Dayton."

DAYTON—See Automatic Control Co.

MOTOR Products Co., 450-52 Atlantic St., Stamford, Conn. "Steer-Lite."

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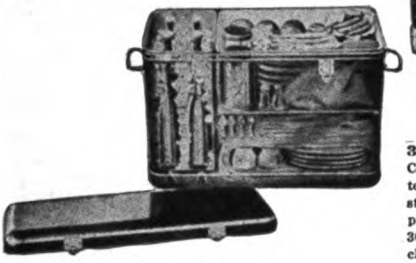
The GLOBE MACHINE & STAMPING COMPANY

GLOBE AUTOMOBILE BOXES FOR 1916

TONNEAU REFRIGERATOR

21 x 8¾ x 16—Price $10.00

To be carried in tonneau. It has rounded bottom free from sharp edges, cannot tear or injure garments or rugs. Ice is contained in bottle compartment. Food compartment is porcelain lined.



Style	Size Inside	Number per Standard Carton	List Price
B-116	10½ x 8¾ x 9¾	6	$2.25
B-127	12 x 8¾ x 9¾	6	2.40
B-1210	11¾ x 9¾ x 10¾	4	2.50
*T-148	13⅞ x 7¾ x 9¾	6	2.50
B-152	15 x 7¾ x 8¾	6	2.40
B-178	16¾ x 7¾ x 10¾	4	2.75
*T-179	16¾ x 8¾ x 10¾	4	2.60
*T-189	17¾ x 7¾ x 10¾	4	2.50
B-1820	17⅞ x 9¾ x 10	4	3.40
B-219	21 x 8¾ x 9	4	3.10
B-220	21¾ x 8¾ x 9¾	6	3.30
*B-229†	22 x 9 x 10¾	4	3.40
*R-229 †RIVAL	22 x 9 x 10¾	4	3.00
*B-2410†	22⅞ x 9¾ x 10¾	2	3.50
*R-2410 †RIVAL	22⅞ x 9¾ x 10¾	2	3.40
B-2910†	28¾ x 10¾ x 10¾	2	5.75

*Indicates the most popular sizes.
†This box has two suit-case catches in addition to lock.

TRUNK BOX

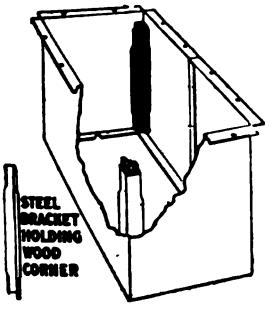
30½ x 14½ x 16 3/16—Price $10.00

Can be attached to running board by two tee-bolts or carried at back of car. All metal, stiffened by raised beads. Nickeled corner pieces. Toggle lock at each end. Holds two 30 x 15 x 7 suit cases, which are not included in the price.

The wide range of GLOBE Boxes in style, quantity and price make this line a convenient and ready seller. Getting all your boxes from one manufacturer simplifies your accounting and will prove far more satisfactory in every way and more economical than dividing your account among various concerns.

Styles B and R Boxes have covers with a radius of one inch. Styles C and T (for trucks) have covers of ⅜ radius. Style R (or Rival) is a frankly competitive product made to supply the demand of those who are primarily interested in price.

All dimensions given are inside dimensions—the prices quoted apply to Boxes finished in fine black enamel and with Yale lock.



Style	Size Inside	Number per Standard Carton	List Price
B1586	15 x7¾ x6¾	6	$2.15
*B1886	17¾ x7¾ x6¾	6	2.40
*R-1886 RIVAL	17¾ x7¾ x6¾	6	2.00
C-2086	19¾ x6¾ x6¾	6	2.25
*B-2296†	22 x9 x6¾	6	2.50
*R-2296 †RIVAL	22 x9 x6¾	6	2.15
B-2416†	22¾ x9¾ x6¾	4	3.50
R-2416 †RIVAL	22¾ x9¾ x6¾	4	3.15

*Indicates most popular sizes.
†This box has two suit-case catches in addition to lock.

Access to the GLOBE Underslung Box is by lifting a floor section. Made with wood corners which serve the same purpose as an entire wood lining—made in any desired size, *to order only.*

Designed especially for use on Ford fore-door cars, but in general use on small cars of other makes. The depth of these boxes allows doors to clear them easily. The cut shows the general shape and appearance of all five sizes, but the three smaller sizes have only the center lock, no catches.

1250 W. 76th Street - - - CLEVELAND, OHIO

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BRACKETS (Continued)

AUTOMATIC HEADLIGHT BRACKETS (Continued)

PETTY Dirigible Headlight Co., McIntyre Bldg., Salt Lake City, Utah.

RADIALITE—See Winona Carriage Co.

RHOADS Automobile Headlight Adjuster Co., 1720 Central Ave., Kansas City, Kans.

STEER-LITE—See Motor Products Co.

WINONA Carriage Co., Winona, Minn. "Radialite."

ZIMMERMAN Headlight Co., 917 E. Broadway, Louisville, Ky.

HEADLIGHT BRACKETS

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

NATIONAL Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

SIDE AND TAIL LAMP BRACKETS

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NATIONAL Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

BRASS

SHEET AND ROD BRASS AND COPPER

(For Tubing—See Tubing, Brass. For Castings—See Castings, Aluminum)

AMERICAN Brass Co. (Ansonia Brass & Copper Branch), Ansonia, Conn.

AMERICAN Brass Co. (Coe Brass Branch), Torrington, Conn.

AMERICAN Brass Co. (Benedict & Burnham Branch), Waterbury, Conn.

AMERICAN Brass Co. (Waterbury Brass Branch), 26 Crane St., Waterbury, Conn.

AMERICAN Brass Co. (Kenosha Branch), Kenosha, Wis.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BUFFALO Copper & Brass Rolling Mill, Military Rd. & Hertel Ave., Buffalo, N. Y.

CHASE Rolling Mill Co., Waterbury, Conn.

DETROIT Copper & Brass Rolling Mills, Clark Ave. & Wabash R. R., Detroit, Mich.

MANHATTAN Brass Co., 328 E. 28th St., New York, N. Y.

MICHIGAN Copper & Brass Co., 1611 Jefferson Ave., W., Detroit, Mich. "Wolverine."

NEW HAVEN Copper Co., Seymour, Conn.

NEW JERSEY Tube Co., Newark, N. J.

PILLING Brass Co., 480 Watertown Ave., Waterbury, Conn.

PLUME & Atwood Mfg. Co., 470 Bank St., Waterbury, Conn.

RANDOLPH-CLOWES Co., Waterbury, Conn.

ROME Brass & Copper Co., Rome, N. Y.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill
(See page 255.)

SEYMOUR Mfg. Co., Seymour, Conn.

STAMFORD German Silver Co., Stamford, Conn.

TAUNTON-NEW BEDFORD Copper Co., Taunton, Mass.

WOLVERINE—See Michigan Copper & Brass Co.

BRAKES

ELECTRIC BRAKES

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

EXPANDING AND CONTRACTING BRAKES

DUNCO—See Dunkirk Corp.

DUNKIRK Corp., Dunkirk, N. Y. "Dunco."

DUPLEX—See Royal Equipment Co.

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

RAYMOND—See Royal Equipment Co.

ROYAL Equipment Co., Bridgeport, Conn. "Raymond," "Duplex."
(See page 123.)

BRAZIERS

CAST IRON BRAZIERS

AALDING Mfg. Co., Manchester, N. H.
(See page 739.)

BIZIER Welding & Cutting Co., 196 11th Ave., New York, N. Y.

HERCULES Welding & Machine Co., 223-25 N. 16th St., Philadelphia, Pa.

LAWRENCE & Co., 292 Halsey St., Newark, N. J.
(See page 799.)

PITTSBURGH Reinforced Brazing & Machine Co., 2525 Liberty Ave., Pittsburg, Pa.

VULCAN Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.

WILKES-BARRE Welding Co., 6 W. Ross St., Wilkes-Barre, Pa.

Complete Index to Classification appears on Pages 8 to 27.

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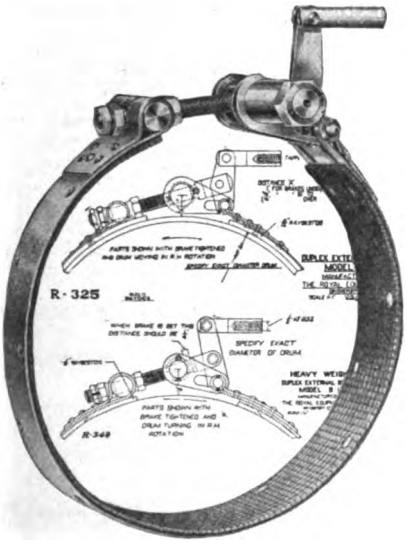

Automobile

BRAKES
BRAKE LININGS
CLUTCH FACINGS

We are specialists in the design and manufacture of automobile brakes required for pleasure cars, trucks and fire apparatus. Send blue prints and specifications and let us quote on your brake requirements.

TRADE MARK Raybestos REG. U.S. PAT. OFF.

Raybestos is the original and recognized standard Asbestos Brake Lining and is used on the great majority of pleasure cars and trucks.

We have continued to improve from year to year the quality and treatment of Raybestos until today it stands supreme in its field.

It is not only extensively used as a Brake Lining but Clutch Facing as well. 80% of the Automobile Manufacturers who have adopted a dry plate clutch are using Raybestos Clutch Rings.

When writing for prices on disc clutch facings, give extreme outside diameter, inside diameter and thickness of ring. On cone clutch facings, large and small diameter of cone, width and thickness of material.

THE ROYAL EQUIPMENT CO.

BRIDGEPORT, CONN. U. S. A.

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BROADCLOTH

UPHOLSTERY BROADCLOTH

(See also Trimmings, Cloth and Carpet)

AMERICAN Mills Co., 17th St. & Fourth Ave., New York, N. Y.

ROY Woolen Co., Watervliet, N. Y.

SLATER & Sons, Webster, Mass.

WATERLOO Woolen Mfg. Co., Waterloo, N. Y.

BROKERS

FINANCIAL BROKERS

GUARANTY Securities Corp., Equitable Bldg., New York, N. Y. (See page 793.)

BRUSHES

MAGNETO, STARTER AND GENERATOR BRUSHES

AMERICAN Carbon & Battery Co., Signal Hill, Ill.

BECKER Bros., 23-25 N. Jefferson St., Chicago, Ill. (See page 129.)

COLEBAUGH Self Lubricating Carbon Co., 1503 Columbia Ave., Philadelphia, Pa.

EBCO—See Electric Brush Co.

ELECTRIC Brush Co., Dover, N. J. "Ebco."

GRAPHITE Metallizing Corp., 1050 Nepperhan Ave., Yonkers, N. Y.

JEANDRON, W. J., 172 Fulton St., New York, N. Y. (Importer.) "Le Carbone."

LE CARBONE—See Jeandron, W. J.

NATIONAL Carbon Co., Cleveland, O.

NUNGESSER Carbon & Battery Co., 1174 E. 38th St., Cleveland, O. (See page 85.)

SPEER Carbon Co., St. Marys, Pa.

STACKPOLE Carbon Co., St. Mary's, Pa. (See page 125.)

SPARK PLUG BRUSHES

AMERICAN Wire Brush Co., 202-04 Centre St., New York, N. Y.

OSBORN Mfg. Co., 5401 Hamilton Ave., N. E., Cleveland, O.

BUCKETS

COLLAPSIBLE BUCKETS

BOKO—See Defiance Welding Co.

DEFIANCE Welding Co., 608 Jackson St., Defiance, O. "Boko."

DUPLEX—See Planet Co.

DU Pont Fabrikoid Co., Wilmington, Del. "Rayntite." (See page 311.)

FAULTLESS—See National Mfg. Co.

GOODRICH Co., B. F., Akron, O.

GOODYEAR Rubber Co., 787 Broadway, New York, N. Y.

GORDON Co., J. P., 302 N. Forth St., Columbus, O. (See page 195.)

HAYES, F. C., Altamont, N. Y.

MARTIN Mfg. Co., Forest Rose Ave., Lancaster, O. (See page 807.)

NATIONAL Mfg. Co., 17th & Locust Sts., Des Moines, Ia. "Faultless."

PILLSBURY Mfg. Co., 322 Hennepin Ave., Minneapolis, Minn. "Wauto." (See page 573.)

PLANET Co., 180 N. Elm St., Westfield, Mass. "Duplex."

RAYNTITE—See Du Pont Fabrikoid Co.

WAUTO—See Pillsbury Mfg. Co.

WHITALL-TATUM Co., 46-48 Barclay St., New York, N. Y.

BUCKLES

STRAP BUCKLES

ANCHOR—See North & Judd Mfg. Co.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

FRAZER & Jones Co., Syracuse, N. Y. (See page 351.)

LYNCH Mfg. Co., 118 E. Washington St., Madison, Wis. (Lock.)

NORTH & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 835.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

TURN-BUCKLES

(See Turn-Buckles, Wrought)

BULBS

RUBBER HORN BULBS

DAVOL Rubber Co., Providence, R. I.

FIRESTONE Tire & Rubber Co., Akron, O.

GOODRICH Co., B. F., Akron, O.

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

PARKER, Stearns & Co., 286 Sheffield Ave., Brooklyn, N. Y.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

TYER Rubber Co., Andover, Mass. "Tyrian."

TYRIAN—See Tyer Rubber Co.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

Complete Index to Classification appears on Pages 8 to 27.

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Stackpole Brushes

THE efficiency of electrical units is directly dependent on the brushes used in them.

The system employed in the car will give the best results if it is fitted with our brushes.

We make carbon, graphite, metal, metal-graphite and carbon-graphite brushes for every type of magneto, starting motor and generator, for old or recently developed starting, lighting and ignition systems of all makes.

We specialize in the production of all carbon and metal brushes for use in automobile equipment and carry in stock the highest grade of brushes and carbon buttons.

We will gladly mail on request our catalog No. 5, which has just come from the press, illustrating nearly 300 brushes used on motor starters, generators, magnetos, etc., and with it we will forward our complete price list giving prices of each brush in various quantities.

Stackpole Carbon Co.
ST. MARYS, PA.

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BUMPERS

AUTOMOBILE BUMPERS

(For protecting Lamps and Radiators)

AETNA Brass Mfg. Co., 3370-90 Hamilton Ave., Cleveland, O.

AMERICAN Brass Fdry. Co., Milwaukee, Wis.

AMERICAN Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.

AUTO Cushion Fender Co., Clinton Bldg., Columbus, O.

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger."
(See page 865.)

BADGER—See Auto Parts Mfg. Co.

BOOTH Bumper Co., Toledo, O.
(See page 443.)

BUCKEYE—See Central Brass & Fixture Co.

BULL DOG—See Toledo Cable Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye." "Champion."

CHAMPION—See Central Brass & Fixture Co.

CHAMPION—See Milwaukee Auto Engine & Supply Co.,

CHICAGO—See Western Brass Mfg. Works.

COMMON SENSE—See Hoover Spring Co.

COMMON SENSE—See Pratt Mfg. Co.

CONCRETE Bumper Co., 214 W. 50th St., New York, N. Y.

CONOVER—See New Jersey Tube Co.

CONQUEROR—See Milwaukee Auto Engine & Supply Co.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "E-Z."
(See page 717.)

DIAMOND—See Sager Co.

DOUGLASS Mfg. Co., 102 Maiden Lane, New York, N. Y.

E. G.—See Grossman Mfg. Co.

E-Z—See Cox Brass Mfg. Co.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Universal."
(See page 127.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HALLADAY Co., L. P., Streator, Ill. "Universal." "Simplex."

HARROUN—See Turner Brass Works.

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

HERCULES—See Milwaukee Auto Engine & Supply Co.

HOOVER Spring Co., 617-37 Turk St., San Francisco, Cal. "Common Sense."

KIMBALL & Co., C. P., Chicago, Ill.
(See page 129.)

LYON—See Metal Stamping Co.

McGREGOR—See U. S. Auto Bumper Co.

MASCO—See Milwaukee Auto Specialty Co.

METAL Stamping Co., 18th St. & Boulevard, Long Island City, N. Y. "Lyon."

MILWAUKEE Auto Engine & Supply Co., 29th St. & Mieneke Ave., Milwaukee, Wis. "Hercules," "Champion," "Conqueror."

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

NATIONAL Automatic Fender Co., McCague Bldg., Omaha, Neb.

NEW JERSEY Tube Co., Newark, N. J. "Conover."

PAMCO—See Auto Devices Co.

PERFECT—See Pratt Mfg. Co.

POLSON Mfg. Co., 27 Chenango St., Buffalo, N. Y.

PRATT Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Common Sense," "Perfect."

SAFETY Mfg. Co., 840-46 Dorr St., Toledo, O.

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y. "Diamond," "Simplex."

SIMPLEX—See Halladay Co.

SIMPLEX—See Sager Co.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich. "Yankee."

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

TOLEDO Cable Co., 506 S. St. Clair St., Toledo, O. "Bull Dog."

TURNER Brass Works, Sycamore, Ill. "Harroun."

U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."

UNIVERSAL—See Gemco Mfg. Co.

UNIVERSAL—See Halladay Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "Chicago."
(See page 817.)

YANKEE—See Simplex Auto Specialty Co.

RUBBER SPRING BUMPERS

ALLIANCE Rubber Co., Alliance, O.
(See page 845.)

AMERICAN Rubber & Tire Co., 70-78 Beach St., Akron, O.

AUTO Devices Co., 3214 Locust St., St. Louis, Mo. "Pamco."
(See page 715.)

BOSTON Belting Co., 84 Linden Park St., Boston, Mass.

BRIDGE Web Tire Co., 2962 Prairie Ave., Chicago, Ill.

CANFIELD Co., H. O., Bridgeport, Conn.

CANFIELD Rubber Co., Bridgeport, Conn.

CENTURY—See Nemo Chemical & Specialty Mfg. Co.

CINCINNATI Rubber Mfg. Co., Cincinnati, O.
(See page 763.)

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa.
(See page 685.)

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ESSEX Rubber Co., Trenton, N. J.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

GOODRICH Co., B. F., Akron, O.

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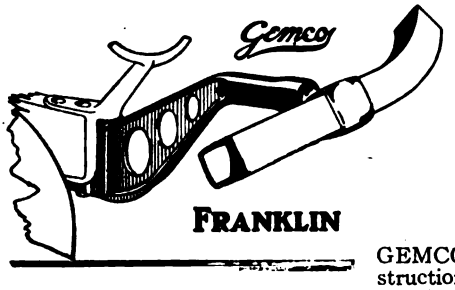
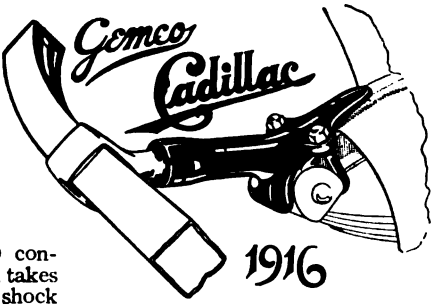
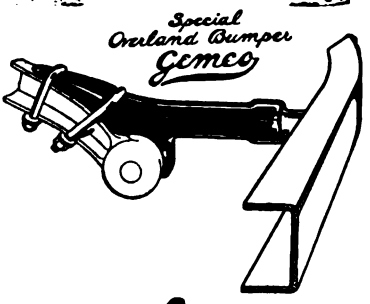
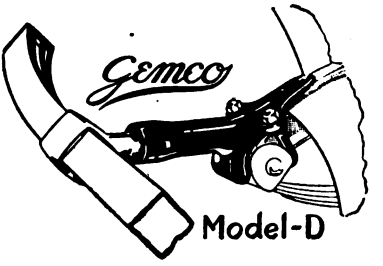
Best Advertised—Easiest Sold

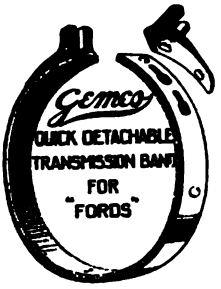




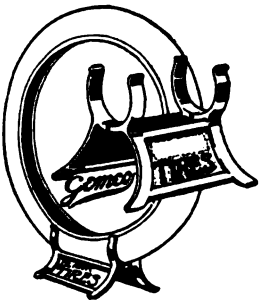
GEMCO construction takes up the shock of a blow where the frame of the car is strongest. The *End Thrust* principle does away with the chance of tearing loose the Bumper Fasteners or bending the frame.



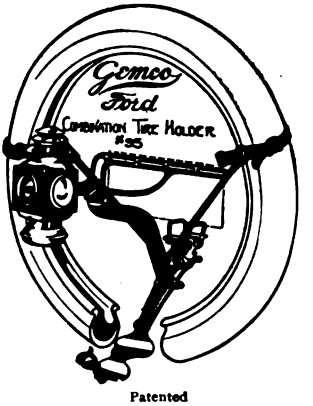




Gemco Tire Display Stand



Fills one of the greatest display needs of the day. Tires displayed in our holders are just where you want them.



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A great time and money saver for Ford owners.

Made of heavy spring steel, lined with the very best grade of transmission brake lining.

Gemco
MILWAUKEE
TRADE MARK
"THE SIGN OF SATISFACTION"

Ford Cars are not equipped with any facilities whatsoever for carrying a spare tire, consequently, the demand for a suitable holder. Attached to the car at one place only.

Order thru your supply house.

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BUMPERS (Continued)

RUBBER SPRING BUMPERS (Continued)

GOODYEAR Tire & Rubber Co., Akron, O.

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill.

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill. "Century."

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick St., Jersey City, N. J.

NEW York Belting & Packing Co., 91 Chambers St., New York, N. Y.

PAMCO—See Auto Devices Co.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

BURNERS

ACETYLENE LAMP BURNERS

ALCO—See American Lava Co.

AMBO—See American Lava Co.

AMERICAN Lava Co., Chattanooga, Tenn. "Alco," "De Luxe," "No-Name," "Ambo," "Hilo," "Duro," "Hexo."

AURORA—See Steward Mfg. Co.

BRAY ELTA—See Crane Co.

BRAY LUTA—See Crane Co.

BRAY RONI—See Crane Co.

BRILLIANT—See Monosmith Bros. Co.

CARROLL, J. B., 3057 Carroll Ave., Chicago, Ill. "Hahn."

CRANE Co., William M., 16-20 W. 32d St., New York, N. Y. (Importers.) "Bray Roni," "Bray Elta," "Bray Luta." (See page 129.)

CRESCENT—See Kirchberger & Co.

DE LUXE—See American Lava Co.

DRAKE Acetylene Burner Co., 1915 Mission St., San Francisco, Cal.

DURO—See American Lava Co.

HAHN—See Carroll, J. B.

HEXO—See American Lava Co.

HILO—See American Lava Co.

KIRCHBERGER & Co., M., 374-80 Second Ave., New York, N. Y. "Crescent," "Von Schwartz," "Perfection," "Koro," "Matador," "Victory."

KORO—See Kirchberger & Co.

MATADOR—See Kirchberger & Co.

MONOSMITH Bros. Co., 500 S. Main St., Spencer, O. "Brilliant."

NO-NAME—See American Lava Co.

NOVELTY Burner Co., Chattanooga, Tenn. "Queen Eta."

PERFECTION—See Kirchberger & Co.

QUEEN ETA—See Novelty Burner Co.

STANDARD Acetylene Burner Co., Tasso, Tenn.

STARR—See Steward Mfg. Co.

STEWARD Mfg. Co., D. M., Chattanooga, Tenn. "Wonder," "Starr," "Aurora."

TENNESSEE Burner Mfg. Co., Chattanooga, Tenn. "X. L."

VICTORY—See Kirchberger & Co.

VON SCHWARZ—See Kirchberger & Co.

WONDER—See Steward Mfg. Co.

X. L.—See Tennessee Burner Mfg. Co.

SPECIAL ACETYLENE LAMP BURNERS

(Automatic and Electric Lighting Burners; see also Lighters, Acetylene Lamp)

ADVANCE Motor Specialties Co., 501 Plymouth Pl., Chicago, Ill. "Matchless."

ALCO CHICAGO—See American Lava Co.

AMERICAN Lava Co., Chattanooga, Tenn. "Alco Chicago."

MATCHLESS—See Advance Motor Specialties Co.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

GASOLINE AND KEROSENE BURNERS

(For Steam Boilers)

OFELDT & Sons, F. W., Nyack, N. Y.

SIMMONS, H. C., North Burlington, Vt.

BUSHINGS

STARTER OR PRIMER ATTACHING BUSHINGS

(For use on motors not equipped with pet cocks)

A. & G. Mfg. Co., West Newton, Mass.

STRYKER, C. W., 240 Shonnard St., Syracuse, N. Y.

BUTTONS

UPHOLSTERY BUTTONS

ATLAS Tack Co., Fairhaven, Mass.

AUTO-VEHICLE Parts Co., Colerain & Monmouth Aves., Cincinnati, O.

HIGGIN Mfg. Co., Newport, Ky.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

LOUNSBERY & Sons, G. H., 107-09 W. Third St., Cincinnati, O.

MILONITE—See Morley Mfg. Co.

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Becker Brothers

MANUFACTURERS

Brushes

Of All Types for

AUTOMOBILES, STATIONARY DYNAMOS and MOTORS

Write for Catalog

23 and 25 North Jefferson St., Chicago, Ill.

51 Years

To remind you that 51 years of experience, the largest factory in the world devoted exclusively to burners and a money back guarantee that they will give satisfaction if properly used are behind

BRAY ACETYLENE BURNERS

Made in England and Sold Everywhere

"Roni":- is the only atmospheric burner producing a flat flame from a single orifice.

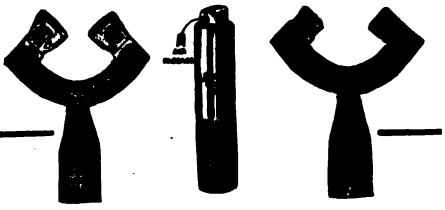
"Elta":- is the only acetylene burner that can be turned down without carbonating.

"Luta":- is noted for its durability and freedom from burner troubles.

Write for Catalog "L"

WM. M. CRANE COMPANY

16-20 West 32nd St., New York, N. Y.



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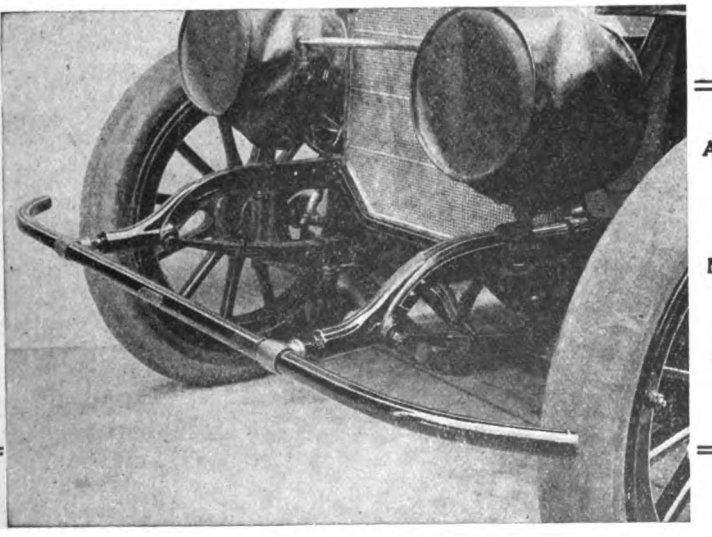
Strongest and best Spring Bumper on the market. The only accessory of this nature that actually improves the appearance of the car

Absorbs the Shock

Protects Radiators and Lamps



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No Rattle

Perfectly Rigid

Send for Catalog and Dealers' Discount.

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BUTTONS (Continued)

UPHOLSTERY BUTTONS (Continued)

MORLEY Mfg. Co., 120 Boylston St., Boston, Mass. "Milonite."

NEIDER Co., F. A., Augusta, Ky.

NEW Haven Button Co., 161 Brewery St., New Haven, Conn.

READE, Chas. W., 346 Sherman Ave., New Haven, Conn.

TOCKWOTTON Co., 79 S. Main St., Providence, R. I.

UNITED Button Co., Union St., Easthampton, Mass.

WHITE Co., L. C., 314 Bank St., Waterbury, Conn.

CABLE

IGNITION CABLE

(See Wire, Insulated)

WIRE CABLE

(See Rope, Bronze Wire; also Rope, Steel Wire)

CAM-SHAFTS

FINISHED OR MACHINED CAM-SHAFTS

COMMERCIAL Machine Co., 31-33 W. Front St., Dunkirk, N. Y. (See page 763.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa. (See page 363.)

JACKSON Motor Shaft Co., Jackson, Mich. (See page 131.)

MUSKEGON Motor Specialties Co., Muskegon, Mich. (See page 133.)

PENINSULAR Auto Parts Co., 46 Lafayette Ave., E., Detroit, Mich.

WYMAN-GORDON Co., Worcester, Mass. (See Back Bone.)

CANOPIES

AUTOMOBILE CANOPIES

(See Tops, Automobile)

CANS

OILING CANS

(For Oil Guns—See Guns, Oil)

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

BLOOMER, R. E., Keithsburg, Ill. "Cannon."

CANNON—See Bloomer, R. E.

DELPHOS Mfg. Co., 100-24 S. Pierce St., Delphos, O.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

EAGLE Glass & Mfg. Co., Wellsburg, W. Va.

GEM Mfg. Co., Goebel & Fulton Sts., Pittsburg, Pa.

HERO Mfg. Co., Gaul & Adams Sts., Philadelphia, Pa.

MAPLE City Mfg. Co., Monmouth, Ill.

NOERA Mfg. Co., 21-97 Griggs St., Waterbury, Conn.

VOGEL & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.

WALL Mfg. Supply Co., P., 720 Preble Ave., Pittsburg, Pa.

WALTERS Mfg. Co., Fulton Bldg., Pittsburgh, Pa.

WILL Mfg. Co., 224 N. Desplaines St., Chicago, Ill.

CAPS

HUB CAPS

(Pressed or Stamped Caps. For Cast Caps—See Castings)

BOSSERT Co., Utica, N. Y. (See page 279.)

BRIDGEPORT Brass Co., Bridgeport, Conn.

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

CROSBY Co., Buffalo, N. Y. (See page 699.)

GIER Pressed Steel Co., Lansing, Mich. (See page 787.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O. (See page 121.)

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. (See page 383.)

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

KONIGSLOW Mfg. Co., Otto., E. 35th St. & Perkins Ave., Cleveland, O.

LINDHOLM Metal Stamping Co., 107-15 Erie St., Camden, N. J. (See page 851.)

OAKES Pressed Steel Co., Indianapolis, Ind.

WORCESTER Pressed Steel Co., Worcester, Mass. (See page 213.)

MOTORISTS CAPS

AMERICAN-BUFFALO Robe Co., 1-7 Howell St., Buffalo, N. Y.

BISHOP Co., J. H., Wyandotte, Mich.

BRADLEY Knitting Co., Delevan, Wis.

DEMMERLE & Co., 116 E. 23d St., New York, N. Y.

DINNER Co., Isaac H., 694 Washington St., Boston, Mass.

FAVORITE Knitting Mills, 1888 W. Sixth St., Cleveland, O.

FORMAN & Co., E., 578 Washington St., Boston, Mass.

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CAPS (Continued)

MOTORISTS CAPS (Continued)

FREEMAN, David, 226 W. Van Buren St., Chicago, Ill.

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

HENDRICKSON Hat Co., A. P., 127-29 S. Meridian St., Indianapolis, Ind.

KAPLAN, Frank & Dunn, 113-15 University Pl., New York, N. Y.

LASKY & Levy, 894 Broadway, New York, N. Y.

PONTIAC Knitting Co., Pontiac, Mich.

REVILLON Freres, 19 W. 34th St., New York, N. Y.

SPEAR & CO., Woodhaven, N. Y.

BRASS RADIATOR CAPS

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BUSH Mfg. Co., Hartford, Conn.
(See page 467.)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

SCOVILL Mfg. Co., 222 W. Lake St, Chicago, Ill
(See page 255.)

TAKE-APART-RADIATOR Co., 804 E. Washington St., Greensburg, Ind.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

RUBBER RADIATOR CAPS

AMERICAN Hard Rubber Co., 9 Mercer St., New York, N. Y.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
(See page 685.)

CROSBY Co., Buffalo, N. Y.
(See page 699.)

GENERAL Insulate Co., 1008-14 Atlantic Ave., Brooklyn, N. Y.

LUZERNE Rubber Co., Trenton, N. J.

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

STOKES Rubber Co., Jos., Trenton, N. J.

VITALIC—See Continental Rubber Works.

CARBIDE

CALCIUM CARBIDE

AMERICAN Carbolite Sales Co., 301 S. 55th Ave., W., Duluth, Minn. "Carbolite."

CARBOLITE—See American Carbolite Sales Co.

UNION Carbide Sales Co., 122 S. Michigan Blvd., Chicago, Ill.

CARBURETERS

GASOLINE CARBURETERS

(For Mixing Valves or Vaporizers—See Vaporizers)

A. W. T.—See American Watch Tool Co.

ACTUS Carburetor & Mfg. Co., 1790 Broadway, New York, N. Y.

AIR-FRICTION Carburetor Co., Dayton, O.
(See page 137.)

AMERICAN Watch Tool Co., Elm St., Waltham, Mass. "A. W. T."

BALL SPRAY—See Shain, Chas. D.

BALL & Ball—See Penberthy Injector Co.

BENNETT — See Wilcox - Bennett Carbureter Co.

BINGHAM Mfg. Co., West Park, O. "Climax."

BOWMAN-EDSON Co., M. K., 64 Dey St., New York, N. Y. "Heath."
(See page 693.)

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

BROWNE—See Holt-Welles Co.

BROWNE-BRANFORD—See Holt-Welles Co.

BYRNE, Kingston & Co., 1040 Webster St., Kokomo, Ind. "Kingston."

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

C. R. G. Mfg. Co., 473 Tremont St., Boston, Mass. "Greuter."

CAMDEN-ANCHOR Rockland Machine Co., Camden, Me. "Knox."

CARTER Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

CENTRAL Brass Mfg. Co., Cleveland, O. "Reedy."
(See page 135.)

CLIMAX—See Bingham Mfg. Co.

D. K. W.—See Duquesne Auto Accessory Co

DALEY, Walter A., 3520 Melrose St., Chicago, Ill.

DETROIT Lubricator Co., Detroit, Mich. "Stewart."
(See page 677.)

DUQUESNE Auto Accessory Co., New Kensington, Pa. "D. K. W."

ECONOMIC—See Kidder, Wellington P.

EDWARDS—See National Carburetor Co.

ENSIGN Carburetor Co., Los Angeles, Cal.

ESS-ESS—See Scott & Sons Co.

FEDERAL Brass Works, 362-74 Trombley Ave., Detroit, Mich. "Zephyr."

FINDEISEN & Kropf Mfg. Co., 2125 Rockwell St., Chicago, Ill. "Rayfield."
(See page 135.)

FLECHTER & Co., L. V., 245 W. 55th St., New York, N. Y.

FULTON-GREUTER Engineering Co., Sixth Ave. & Baymiller St., Cincinnati, O.

G. & A. Carburetor Co., 450-52 Sixth Ave., New York, N. Y.

GARDNER Carbureter & Brass Works, Shreveport, La.

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y. "Maco."

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CARBURETERS (Continued)

GASOLINE CARBURETERS (Continued)

GRAVITY Carburetor Co., 3701 Perkins Ave., Cleveland, O.

GREUTER—See C. R. G. Mfg. Co.

H & N Carburetor Co., 1790 Broadway, New York, N. Y. (See pages 300 and 301.)

HEATH—See Bowman-Edson Co.

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco." (See page 675.)

HOLLEY Bros. Co., Detroit, Mich.

HOLT-WELLES Co., 1790 Broadway, New York, N. Y. "Browne," "Browne-Branford."

HOLTZER-CABOT Electric Co., Roxbury, Mass. "Newcomb."

HOYT Carbureter & Automobile Co., 45 Union Ave., Boston, Mass.

INDIANAPOLIS Mfg. & Sales Co., 2305 N. Delaware St., Indianapolis, Ind.

J-B—See Thermostatic-Carburetor Corp.

JOHNSON Co., 280 Harper Ave., Detroit, Mich.

JUHASZ Carbureter Co., 244 W. 49th St., New York, N. Y.

JUSTRITE—See Wilcke-Armstrong Co.

K. D. Carburetor Co., 5915 Bonna Ave., Cleveland, O.

KEMP, J. P., Evesham & Henderson Aves., Baltimore, Md.

KEROSENE Burning Carbureter Co., 9 Selden Ave., Detroit, Mich.

KIDDER, Wellington P., 18 Robeson St. (Jamaica Plain), Boston, Mass. "Economic."

KINGSTON—See Byrne, Kingston & Co.

KNOX—See Camden-Anchor Rockland Machine Co.

LIGHT Mfg. & Foundry Co., Pottstown, Pa. "Parkin." (See page 403.)

LONGUEMARE Carburetor Co., 1876 Broadway, New York, N. Y. (Importers.)

M. T.—See Sunderman Corp.

MACO—See Gleason-Peters Air Pump Co.

MARVEL Carbureter Co., Flint, Mich. (See pages 135 and 597.)

MASTER Carbureter Corp., 1523-31 Fort St., W., Detroit, Mich.

MAYER Carburetor Co., 2673 Main St., Buffalo, N. Y.

MILLER Carburetor Sales Corp., 2526 Michigan Ave., Chicago, Ill. (See page 597.)

MILLER Carburetor Co., Los Angeles, Cal.

NATIONAL Auto Accessory Co., Salem Depot, N. H.

NATIONAL Carburetor Co., 154 Whiting St., Chicago, Ill. "Edwards."

NEW Speed Carburetor Co., 1657 Van Ness Ave., San Francisco, Cal.

NEWCOMB—See Holtzer-Cabot Electric Co.

NORTH Chicago Machine Co., 22d St. & Commonwealth Ave., North Chicago, Ill. "Palmbla."

P R Mfg. Co., 621 Bellevue Ave., Detroit, Mich.

PALMBLA—See North Chicago Machine Co.

PARKIN—See Light Mfg. & Foundry Co.

PENBERTHY Injector Co., Detroit, Mich. "Ball & Ball." (See page 137.)

PRICE, John R., 68 Marshall St., Newark, N. J.

QUADRUPLEX—See Walker Co.

RAYFIELD—See Findeisen & Kropf Mfg. Co

REEDY—See Central Brass Mfg. Co.

REID Appliance Co., Smith Bldg., Detroit, Mich.

RUSSELL Eureka Carburetter Co., Rudd, Ia

SCHEBLER—See Wheeler & Schebler.

SCOTT & Sons Co., Medford, Mass. "Ess-Ess."

SHAIN, Chas. D., Brooklyn, N. Y. "Ball Spray."

SHAKESPEARE, Jr., Co., Wm., Kalamazoo, Mich.

STEWART—See Detroit Lubricator Co.

STEWART Machine Works, Alfred C., Tenth & Santee Sts., Los Angeles, Cal.

STROMBERG Motor Devices Co., Dept. S., 64 E. 25th St., Chicago, Ill. (See page 137.)

SUNDERMAN Corp., Newburgh, N. Y. "M. T." (See page 757.)

SWAN Carburetor Co., 540 Van Ness Ave., San Francisco, Cal.

TABER Carburetor Co., 239-41 Water St., Binghamton, N. Y. (See page 707.)

THERMOSTATIC Carburetor Corp., 412 W. Sixth St., Los Angeles, Cal. "J-B."

TILLOTSON Carburetor Co., Toledo, O.

VAN BRIGGLE Motor Device Co., Fletcher Trust Bldg., Indianapolis, Ind.

WALKER Co., O. S., Rockdale St., Worcester, Mass. "Quadruplex."

WEBBER Mfg. Co., 66-68 Stanhope St., Boston, Mass. (See page 837.)

WESTERN Motor Appliance Co., 201 Main St., Charles City, Ia.

WHEELER & Schebler, Indianapolis, Ind. "Schebler." (See page 783.)

WILCKE-ARMSTRONG Co., 182 Beaubien St., Detroit, Mich. "Justrite."

WILCOX-BENNETT Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

ZENITH Carburetor Co., Detroit, Mich. (See page 559.)

ZEPHYR—See Federal Brass Works.

KEROSENE CARBURETERS

BENNETT—See Wilcox-Bennett Carburetter Co.

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

CAMDEN-ANCHOR Rockland Machine Co., Camden, Me. "Knox."

DUPLEX—See H & N Carburetor Co.

H & N Carburetor Co., 1790 Broadway, New York, N. Y. "Duplex." (See pages 300 and 301.)

Complete Index to Classification appears on Pages 8 to 27.

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THE

REEDY

CARBURETOR

WILL GIVE YOU

More Miles Per Gallon
More Power Per Gallon
More Flexibility
More "Pep" and "Punch"

THE CENTRAL BRASS MFG. CO.
CLEVELAND (Sixth City) OHIO

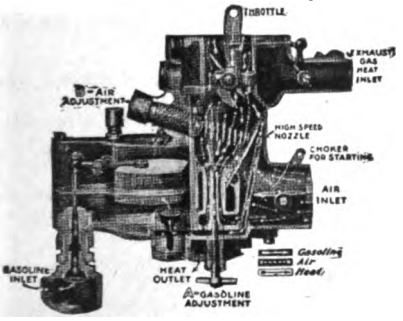
MARVEL

"It's name defines it"

CARBURETER

ECONOMY, POWER, ACCELERATION

Puts the "Punch" in the car without the sacrifice of economy.



MODEL E

Standard Equipment on Buick, Oakland, Olds, G.M.C. Trucks, Wilson Trucks, Independent Motors, Etc.

Models in stock adapted to all makes of pleasure and commercial cars. All carbureters sold on 30-day trial, money back if not satisfied

Write for Model E Booklet

MARVEL CARBURETER CO.
Flint, Mich., U.S.A.

RAYFIELD

CARBURETORS

Saving Money for Automobile Owners?

Some Good News Here!

We would not tell you that the Rayfield carburetor will materially cut your gasoline bills if it had not done so for thousands of others.

And that it has made a gallon of gas go much farther on literally hundreds of thousands of cars is the best reason for your purchase. You must be convinced.

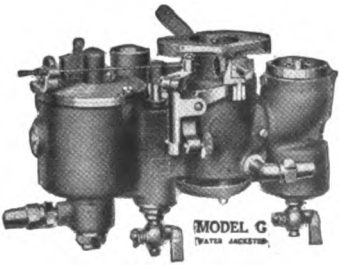
In every line there is one article generally known as the leader, and in the carburetor field it is the Rayfield. We positively guarantee to you, on a money-back basis, a gasoline saving of 10% to 50%.

Some motorists procrastinate on the carburetor question, regardless of the great difference in carburetors, and the many failures to handle low grade fuel properly.

Our suggestion to you is not to put it off, for the purchase of a Rayfield carburetor will prove one of the most economical and satisfactory choices you ever made.

Get it today. You are to be the only judge of the efficiency of the Rayfield we have for you. If you don't like it—money back!

Order through your dealer. Write us for information.



FINDEISEN & KROPF MFG. CO.
2125 Rockwell Street, Chicago

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CARBURETERS (Continued)

KEROSENE CARBURETERS (Continued)

HARROUN—See Invincible Mfg. Co.

INVINCIBLE Mfg. Co., Pittsburg, Pa. "Harroun."

KEROSENE Burning Carbureter Co., 9 Selden Ave., Detroit, Mich.

KNOX—See Camden-Anchor Rockland Machine Co.

MASTER Carbureter Corp., 1523-31 Fort St., W., Detroit, Mich.

REID Appliance Co., Smith Bldg., Detroit, Mich.

RUSSELL Eureka Carburetter Co., Rudd, Ia.

SENRAB Carburetor Co., Sea Cliff, N. Y.

UNIVERSAL Oil Converter Co., 67 Sixth St., Long Island City, N. Y.

WESTERN Motor Appliance Co., 201 Main St., Charles City, Ia.

WILCOX-BENNETT Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

CARPET

COACH CARPET

(See also Trimmings, Cloth and Carpet)

COCHRANE Mfg. Co., East Dedham, Mass.

DOBSON, John & James, 809 Chestnut St., Philadelphia, Pa.

HIRST-ROGER Co., Allegheny & Kensington Ave., Philadelphia, Pa.
(See page 137.)

SCHOFIELD, Mason & Co., Fairhill, Reese & Cumberland Sts., Philadelphia, Pa.

CASES

BATTERY CASES

(See Boxes, Battery)

CARD CASES

(See Cases, Toilet)

EXTRA LAMP BULB CASES

(Steel cases or boxes for carrying spare lamp bulbs on car).

AUBURN Leather Goods Co., Auburn, N. Y.
(See page 309.)

CAMPBELL—See Perkins-Campbell Co.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

J & B Mfg. Co., Pittsfield, Mass.
(See page 613.)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

MEDICAL EMERGENCY CASES

ACCIDENT Cabinet Co., Kalamazoo, Mich.

BURROUGHS, Wellcome & Co., 35-39 W. 32d St., New York, N. Y. "Tabloid."

K. W. P. Co., 907 S. Michigan St., South Bend, Ind.

SHARP & Smith, 103 N. Wabash Ave., Chicago, Ill.

TABLOID—See Burroughs, Wellcome & Co.

SPARK COIL CASES

(See Boxes, Spark Coil)

SPARK PLUG CASES

(Leather cases for holding spare plugs)

ALGCO—See Auburn Leather Goods Co.

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

AUBURN Leather Goods Co., Auburn, N. Y. "Algco."
(See page 309.)

CAMPBELL—See Perkins-Campbell Co.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

TIRE AND TUBE CASES

(For covering spare tires and tubes)

ALLEN Auto Specialty Co., 1926 Broadway, New York, N. Y.
(See page 163.)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. "Howard," "Chicago."
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BAILEY Co., R. B., 406 W. Pico St., Los Angeles, Cal. "Fitwell."

CHICAGO—See Atlas Specialty Mfg. Co.

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

DAFOE-EUSTICE Co., Jefferson Ave. & Antoine St., Detroit, Mich. "Duk-Bak."

DUK-BAK—See Defoe-Eustice Co.

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

FITWELL—See Bailey Co.

FITZWELL—See Niagara Fabric Mfg. Co.

FULLER Co., G. W., 182-84 Asylum St., Hartford, Conn.

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

GORDON Co., J. P., 302 N. Forth St., Columbus, O.
(See page 195.)

GOSS Co., J. C., 16 Woodbridge St., E. Detroit, Mich.

H-B—See Hopewell Bros.

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AUTOMOBILE AND CARRIAGE CARPET

SAMPLES UPON REQUEST

Any width up to 54 inches Wool, Worsted, Jute, Horse Hair in any grade and quality.

The Hirst-Roger Co.
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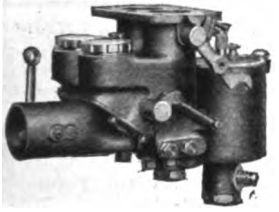
Phila., Penna.

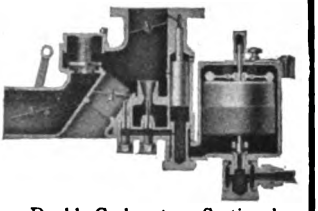
Stromberg Motor Devices Co. Dept. S-44 Peterseth St., Chicago



Double Carburetor—Exterior

PENBERTHY TRADE MARK

BALL & BALL CARBURETOR

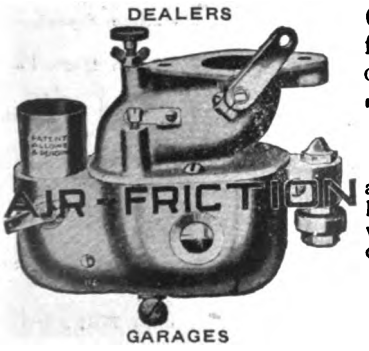


Double Carburetor—Sectional

A two stage instrument—giving high atomizing in primary stage and maximum power in second stage. High mileage—very strong pick-up—strong idling and slow running—freedom from stalling—absolute uniformity of performance—no service stations necessary.

Endorsed by and standard equipment on several leading cars. Descriptive circular on request.

Made by PENBERTHY INJECTOR CO., Detroit, Mich., U. S. A.



GREATER PROFIT can be made and you can furnish better **SATISFACTION** on either a new or old motor by using

The Air-Friction Carburetor

which is scientifically constructed

and will **PRODUCE** an **INCREASE** in **POWER** and **MILEAGE** with resultant increase in **ECONOMY** that will astonish. We make a specialty of fitting any make of car without changing present connections.

Results Guaranteed

The Air-Friction Carburetor Company
DAYTON, OHIO

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CASES (Continued)

TIRE AND TUBE CASES
(Continued)

HOPEWELL Bros., Watertown, Mass. "Russell," "H.B."
(See page 617.)

HOWARD—See Atlas Specialty Mfg. Co.

KEYSTONE—See Nathan Novelty Mfg. Co.

HOWARD—See Atlas Specialty Mfg. Co.

IMPERIAL—See Winship, W. W.

LANDERS Bros. Co., Dept. A 2, Toledo, O.
(See page 351.)

MARTIN Mfg. Co., Forest Rose Ave., Lancaster, O.
(See page 807.)

MERCHANT & Evans Co., Philadelphia, Pa. "Star."
(See page 405.)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. "Keystone," Presto."
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y. "Fitzwell."

PREMIER Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

PRESTO—See Nathan Novelty Mfg. Co.

RUSSELL—See Hopewell Bros.

SALA Co., Canton, O.

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

STAR—See Merchant & Evans Co.

TAYLOR Trunk Works, C. A., 39 E. Randolph St., Chicago, Ill.

WILEY & Son Co., Wm. H., 90 Pliny St., Hartford Conn.

WINSHIP, W. W., 71 Summer St., Boston, Mass. "Imperial."

TOILET AND CARD CASES

ART Work Shop, 441-49 Ellicott St., Buffalo, N. Y.
(See page 671.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

KRAFT & Sons, Theo., 458 W. Broadway, New York, N. Y.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y.
(See page 223.)

PERPENTE Mfg. Co., State & Wall Sts., New Haven, Conn.

RUMPP & Sons, C. F., Fifth & Cherry Sts., Philadelphia, Pa.

RUSZITS Fur Co., John, 7 E. 48th St., New York, N. Y.

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y.

TOOL CASES

(See Bags, Tool; also Boxes, Tool)

CASTINGS

ALUMINUM CASTINGS

A. B. C. Castings Co., 6515 Carnegie Ave., S. E., Cleveland, O.

ADAMS & Westlake Co., Chicago, Ill. "Adlake."
(See page 423.)

ADLAKE—See Adams & Westlake Co.

ALLYNE—See Aluminum Castings Co.

ALMACO—See Aluminum Mfg. Co.

ALUMINITE—See Green Engineering Co.

ALUMINUM Castings Co., 6217 Carnegie Ave., Cleveland, O. "Lymite."
(See page 139.)

ALUMINUM Foundry Co., Bauch St., Sebring, O.

ALUMINUM Mfg. Co., Des Moines Ia. "Almaco."
(See page 439.)

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

AMERICAN Bronze Co., 90-108 Arthur St., Buffalo, N. Y.

AMERICAN Castings Co., Byrket St. & L. S. & M. S. Ry., Mishawaka, Ind.

AMESBURY Brass & Foundry Co., Amesbury, Mass.

ATLAS Brass Foundry Co., 980-90 S. Front St., Columbus, O.

BLAKE, Edwin J., 565 Windsor St., Hartford, Conn.

BUCKEYE Brass & Mfg. Co., 1307 Columbus Rd., Cleveland, O.

BUNTING Brass & Bronze Co., 737 Spencer St., Toledo, O.
(See page 335.)

CHAMPION Brass Works, 260 Division St., Coldwater, Mich.

CITY Brass Foundry Co., 5310 St. Clair Ave., N. E., Cleveland, O.

CRAMP & Sons Ship & Engine Bldg. Co., William, Philadelphia, Pa.
(See page 335.)

D'ESTE Co., Julian, 26 Canal St., Boston, Mass.

DELAWARE Brass & Aluminum Co., Muncie, Ind.
(See page 147.)

DIAMOND Brass Foundry & Machine Co., 1115 Washington Blvd., Chicago, Ill.

DORCHESTER Brass & Aluminum Foundry, Old Sturtevant Bldg. (Jamaica Plain), Boston, Mass.

ELECTRIC Materials Co., North East, Pa.

ERIE Specialty Co., 505 W. 12th St., Erie, Pa.

ESSEX Brass Foundry Co., Sixth & Harvard Sts., Cambridge, Mass.

EXETER Machine Works, Pittston, Pa.

FARIES Mfg. Co., Decatur, Ill.

FISCHER Sweeney Bronze Co., 1302-06 Clinton St., Hoboken, N. J.

GENERAL Aluminum & Brass Mfg. Co., Detroit, Mich.
(See page 333.)

GENERAL Castings Co., Ford Bldg., Detroit, Mich.

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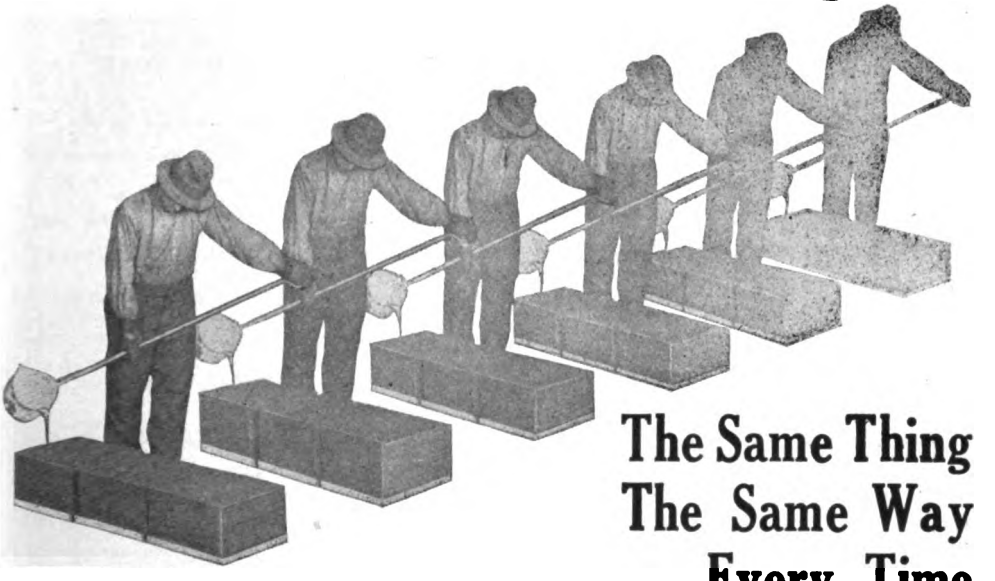
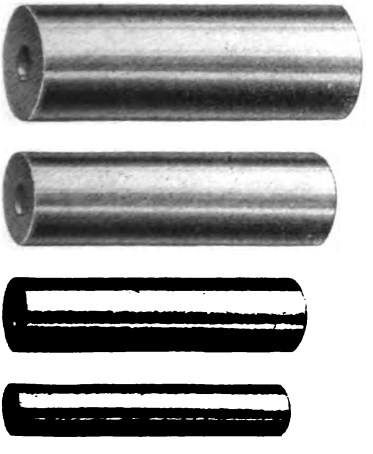
LYNUX MORE THAN AN ALLOY — Bushings and Bearings



The Same Thing The Same Way Every Time



The care that goes into the mold comes out in the bushing

THE analysis has been made, the ingredients mixed and melted. Into the mold goes the molten metal, a crucial point in the making of a casting.

For unless the pouring temperature is always the same for each job, there'll be pits and rough spots in the finished work.

In the production of LYNUX, scientific foundry practice and technical control prevent variation in the pouring temperature. To this expert handling of the metal, as much as to the analysis, is due its uniformly superior quality.

"LYNUX 98" is a bearing bronze alloy for heavy duty. Bushings made of it will outwear any other bronze alloy bushings.

We carry a large stock of bushings for immediate shipment in rough sizes, from 1 to 6-inch diameter, 12-inch lengths and various diameters of core. Also 12-inch solid bars, round and hexagon, with diameters of various sizes.

Remember this the next time you are in a hurry to replace a broken bearing and keep a machine running.

THE ALUMINUM CASTINGS COMPANY

LYNITE and LYNUX Castings

CLEVELAND DETROIT BUFFALO MANITOWOC, WIS. FAIRFIELD, CONN.

Address correspondence to 6217 Carnegie Avenue, Cleveland, Ohio

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CASTINGS (Continued)

ALUMINUM CASTINGS (Continued)

GERMANN Bronze Co., 355 W. 19th St., Erie, Pa.

GERSON-CAREY Co., Kalamazoo St. & L. S. Ry., Lansing, Mich.

GRAHAM & Co., James, 293 Wooster St., New Haven, Conn.

GREEN Engineering Co., Dayton, O. "Aluminite."
(See page 869.)

HARLEY Co., Springfield, Mass.
(See page 851.)

HOTZ Foundry & Mfg. Co., Fremont, O.

HOWARD Metal Co., Second & Canal Sts., Reading, Pa.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

INDIANA Brass Co., 659 W. McClurg St., Frankfort, Ind.

INDIANAPOLIS Brass Co., 1012 E. Michigan St., Indianapolis, Ind.

JEFFERSON Brass Foundry, 309 King St., Brooklyn, N. Y.

K & M Brass & Aluminum Castings Co., 10611-13 Quincy Ave., Cleveland, O.

KEELER Brass Co., 361-71 Godfrey Ave., Grand Rapids, Mich.

KEYLESS Lock Co., 1401 Newman St., Indianapolis, Ind.

KOKOMO Brass Works, Kokomo, Ind.

KRAMM Foundry Co., H. D., 1125 E. Georgia St., Indianapolis, Ind. "Maluminum."
(See page 503.)

LALOR Valve Co., 527 Colvin St., Baltimore, Md.

LEE Co., Wm. O., Port Huron, Mich.

LEVETT Co., W. M., 417 E. 23d St., New York, N. Y.

LIGHT Mfg. & Foundry Co., Pottstown, Pa.
(See page 403.)

LIMERICK Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

LOGANSPORT Castings Co., Logansport, Ind.

LYNITE—See Aluminum Castings Co.

McADAMITE—See United States McAdamite Metal Co.

MACHINISTS Foundry Co., Tenth St. & Macedonia Ave., Muncie, Ind.

MALUMINUM—See Kramm Foundry Co.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727 and 819.)

MICHAELS Bronze Co., 230-40 Scott St., Covington, Ky.

MONUMENTAL Bronze Co., 354 Howard St., Bridgeport, Conn.

MUSKEGON Aluminum Foundry Co., Clay & Ninth Sts., Muskegon, Mich.

NABRALCO—See National Bronze & Aluminum Foundry Co.

NATIONAL Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

NATIONAL Bronze & Aluminum Foundry Co., 3539 E. 79th St., Cleveland, O. "Nabralco."

NESTCO—See Newark Stamping & Foundry Co.

NEWARK Stamping & Foundry Co., Newark, O. "Nestco."

NORTH & Judd Mfg. Co., New Britain, Conn.
(See page 835.)

OBERDORFER Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

PARKER White Metal & Machine Co., Railroad St., Erie, Pa.
(See page 149.)

PAULSON & Son, Thomas, 97 Second Ave., Brooklyn, N. Y.
(See page 731.)

PHOENIX Die Casting Co., 21 Illinois St., Buffalo, N. Y.
(See page 867.)

PROVIDENCE Brass & Aluminum Foundry, 460 Eddy St., Providence, R. I.

RACINE Aluminum & Brass Foundry Co.,

RACINE Brass & Iron Co., 1327 Racine St., Racine, Wis.

REEVES & Co., Paul S., 1415-25 Catharine St., Philadelphia, Pa.

RINCON Foundry Co., 349-65 Seventh St., San Francisco, Cal.

ROSTAND Mfg. Co., Milford, Conn.

SAYRE Stamping Co., Sayre, Pa.

SHARP Brass Works, J. C., Boyce & 30th Sts., Chattanooga, Tenn.

SHERWOOD Brass Works, 1167 Jefferson Ave., Detroit, Mich.

SILVER Aluminum Metal Co., 294-96 Taaffe Pl., Brooklyn, N. Y.

STANDARD Brass Foundry Co., 1331 Columbus Rd., N. W., Cleveland, O.

STANDARD Foundry Co., Hartford, Conn.

TITAN Copper Products Co., Buffalo, N. Y.

TITANIUM Alloy Mfg. Co., Sugar & Lafayette Sts., Niagara Falls, N. Y.

TRIUMPH Electric Co. (Oakley), Cincinnati, O.

UNITED States McAdamite Metal Co., Isabella Ave. & E. St., Detroit, Mich. "McAdamite."

VAN Wagner Mfg. Co., E. B., Syracuse, N. Y.
(See page 141.)

WERRA Aluminum Foundry Co., Waukesha, Wis.
(See page 805.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WILLIAMS & Son, E. A., 105-11 Plymouth St., Jersey City, N. J.

WISCONSIN Aluminum Foundry Co., Manitowoc, Wis.

BRONZE AND BRASS CASTINGS

A. B. C. Castings Co., 6515 Carnegie Ave., S. E., Cleveland, O.

ADAMS & Westlake Co., Chicago, Ill. "Adlake."
(See page 423.)

ADLAKE—See Adams & Westlake Co.

AETNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ALUMINUM Castings Co., 6217 Carnegie Ave., Cleveland, O. "Lynux."
(See page 139.)

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

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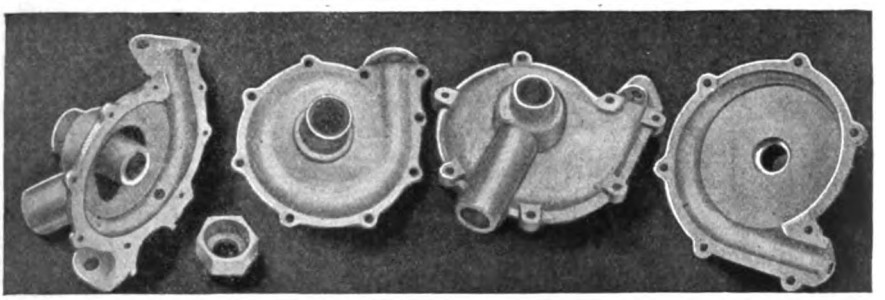


Van Wagner Die Castings

are extremely accurate and efficient in point of accuracy and alloy.

Bearings
Water Pump Parts
Oil Pump Parts
Carburetor Parts
Steering Gear Sectors (Aluminum)
Spark and Throttle Control (Aluminum)
Magneto Parts (Aluminum)
Self-Starting Device Parts (Aluminum and other alloys)

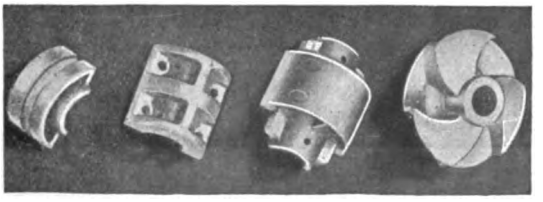
In fact, any parts which are now sand cast in aluminum or brass where tensile strength requirements are not too exacting.

With facilities and equipment second to none and with an organization of the broadest experience which can be secured only by a concern of such ample resources as we possess, we are enabled to guarantee both quality and promptness in deliveries in any quantity from preliminary samples to the most exacting requirements of the largest users of Die Castings. Our quotations give the most practical demonstration of the efficiency and ability of this organization.

Ask us for quotations because of our ability to give lower prices and better quality

E. B. Van Wagner Manufacturing Company

SYRACUSE, NEW YORK, U. S. A.



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CASTINGS (Continued)

BRONZE AND BRASS CASTINGS (Continued)

AMERICAN Bronze Co., 140-80 Non-Gran Blvd., Berwyn, Pa.
(See page opposite Inside Front Cover.)

AMERICAN Bronze Co., 90-108 Arthur St., Buffalo, N. Y.

AMERICAN Castings Co., Byrket St. & L. S. & M. S. Ry., Mishawaka, Ind.

AMERICAN Manganese Bronze Co. (Holmesburg), Philadelphia, Pa.

AMERICAN Pin Co. (Waterville Station), Waterbury, Conn.

AMESBURY Brass & Foundry Co., Amesbury, Mass.

ANDERSON Foundry Co., Wm. B., 24-30 S. Clinton St., Chicago, Ill.

ATLAS Brass Foundry, 155 A St., Boston, Mass.

ATLAS Brass Foundry Co., 980-90 S. Front St., Columbus, O.

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BAY View Foundry Co., McDonough, Water & Shelby Sts., Sandusky, O.

BLAKE, Edwin J., 565 Windsor St., Hartford, Conn.

BOSTON Casting Co., 13 Pearl St., Boston, Mass.

BUCKEYE Brass & Mfg. Co., 1807 Columbus Rd., Cleveland, O.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

BUNTING Brass & Bronze Co., 737 Spencer St., Toledo, O.
(See page 335.)

BURNS & Bassick Co., Bridgeport, Conn.
(See page 211.)

CARTER, E. T., Plainville, Conn.

CENTRAL Brass Foundry, 105-07 S. Clinton St., Chicago, Ill.

CENTRAL Brass Mfg. Co., Cleveland, O.
(See page 135.)

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CHAMPION Brass Works, 260 Division St., Coldwater, Mich.

CITY Brass Foundry Co., 5310 St. Clair Ave., N. E., Cleveland, O.

CONSOLIDATED Casting Co., Mechanicsville, N. Y.

CRAMP & Sons Ship & Engine Bldg. Co., William, Philadelphia, Pa.
(See page 335.)

DAMASCUS Bronze Co., Pittsburg, Pa.

DAYTON Bronze Bearing Co., 916-18 E. Third St., Dayton, O.

D'ESTE Co., Julian, 26 Canal St., Boston, Mass.

DELAWARE Brass & Aluminum Co., Muncie, Ind.
(See page 147.)

DETROIT Motor Casting Co., 399-303 Beaufait Ave., Detroit, Mich.

DIAMOND Brass Foundry & Machine Co., 1115 Washington Blvd., Chicago, Ill.

DORCHESTER Brass & Aluminum Foundry, Old Sturtevant Bldg. (Jamaica Plain), Boston, Mass.

EAGLE—See Stillman White Foundry Co.

EDNA Brass Mfg. Co., 525-33 Reading Rd., Cincinnati, O.

ELECTRIC Materials Co., North East, Pa.

ELEPHANT—See Phosphor Bronze Smelting Co.

ELLSWORTH Brass Foundry Co., 249 R. R. Ave., Bridgeport, Conn.

ERIE Specialty Co., 505 W. 12th St., Erie, Pa.

ESSEX Brass Foundry Co., Sixth & Harvard Sts., Cambridge, Mass.

EUREKA Brass Co., 2210-18 Scott Ave., St Louis, Mo.

EUREKA Co., North East, Pa.
(See page 333.)

EXETER Brass Works, Exeter, N. H.

EXETER Machine Works, Pittston, Pa.

FAIRVIEW Foundry Co., ft. Vanilla Ave., Detroit, Mich.

FARIES Mfg. Co., Decatur, Ill.

FISCHER-SWEENEY Bronze Co., 1302-06 Clinton St., Hoboken, N. J.

FORE River Shipbuilding Corp., Quincy, Mass.

FOSTER, Merriam & Co., Meriden, Conn.

FRIES & Co., 89-93 Main St., Buffalo, N. Y.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GENERAL Aluminum & Brass Mfg. Co., Detroit, Mich.
(See page 333.)

GENERAL Castings Co., Ford Bldg., Detroit, Mich.

GERMANN Bronze Co., 355 W. 19th St., Erie, Pa.

GERSON-CAREY Co., Kalamazoo St. & L. S. Ry., Lansing, Mich.

GLANTZ & Johnson, 108 Foote Ave., Jamestown, N. Y.

HARLEY Co., Springfield, Mass.
(See page 851.)

HARPER, Thomas, 204 Lafayette St., New York, N. Y.

HERCULES Float Works, 200-10 Franklin St., Springfield, Mass.

HOMER Brass Works, 231 Race St., Philadelphia, Pa.

HOTZ Foundry & Mfg. Co., Fremont, O.

HOWARD Metal Co., Second & Canal Sts., Reading, Pa.

IDEAL Bronze Co., 1265 E. 55th St., Cleveland, O.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

INDIANA Brass Co., 659 W. McClurg St., Frankfort, Ind.

INDIANAPOLIS Brass Co., 1012 E. Michigan St., Indianapolis, Ind.

IVES Co., H. B., 5-17 Artisan St., New Haven, Conn.

JEFFERSON Brass Foundry, 209 King St., Brooklyn, N. Y.

JOHNSON Bronze Co., New Castle, Pa.

K & M Brass & Aluminum Castings Co., 10611-13 Quincy Ave., Cleveland, O.

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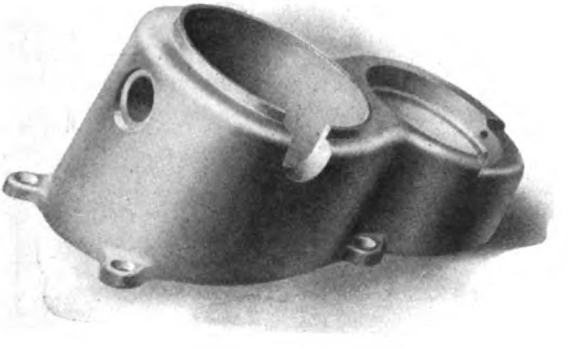
IN ALUMINUM

AND WHITE METAL ALLOYS

are extensively used by the largest and most conservative Automobile Manufacturers—not alone because of the economies thereby effected—but because in most cases a more satisfactory article is obtained than could be produced by other methods.



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NEWARK. N.J. TOLEDO. OHIO.

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CASTINGS (Continued)

BRONZE AND BRASS CASTINGS (Continued)

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

KEYLESS Lock Co., 1401 Newman St., Indianapolis, Ind.

KOKOMO Brass Works, Kokomo, Ind.

LALOR Valve Co., 527 Colvin St., Baltimore, Md.

LANGSENKAMP-WHEELER Brass Works, 1206-28 Shelby St., Indianapolis, Ind.

LEE Co., Wm. O., Port Huron, Mich.

LEVETT Co., W. M., 417 E. 23d St., New York, N. Y.

LIGHT Mfg. & Foundry Co., Pottstown, Pa.
(See page 403.)

LIMERICK Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

LOGANSPORT Castings Co., Logansport, Ind.

LUMEN Bearing Co., Buffalo, N. Y.
(See page opposite Last Page.)

LUSK Bros., Foundry Co., 209-15 Van Buren St., Jackson, Mich.

LYNUX—See Aluminum Castings Co.

McGILL Metal Co., Valparaiso, Ind.

MACHINISTS Foundry Co., Tenth St. & Macedonia Ave., Muncie, Ind.

MAXWELL Engineering Co., Rome, N. Y.

MEDINA Stamping & Machine Co., 317 Main St., Medina, N. Y.

MESTA Machine Co., Pittsburgh, Pa.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727 and 819.)

METROPOLITAN Mfg. Co., Detroit, Mich.
(See page 479.)

MICHAELS Bronze Co., 230-40 Scott St., Covington, Ky.

MILWAUKEE Valve Co., 139 Burrell St., Milwaukee, Wis.

MONUMENTAL Bronze Co., 354 Howard St., Bridgeport, Conn.

MUELLER Metal Co., 288 Dyer St., Providence, R. I.

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (Distributors.)
(See page 867.)

MUSKEGON Aluminum Foundry Co., Clay & Ninth Sts., Muskegon, Mich.

NABRALCO—See National Bronze & Aluminum Foundry Co.

NATIONAL Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

NATIONAL Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, O. "Nabraloo."

NESTCO—See Newark Stamping & Foundry Co.

NEWARK Stamping & Foundry Co., Newark, O. "Nestco."

NOLTE Brass Co., 27-29 W. Jefferson St., Springfield, O.

NORTH & Judd Mfg. Co., New Britain, Conn.
(See page 835.)

NORWALK Brass Co., Keyser Pl., South Norwalk, Conn.

OBERDORFER Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

ONONDAGA Brass Co., Decker & Brown Sts., Syracuse, N. Y.

PARKER White Metal & Machine Co., Railroad St., Erie, Pa.
(See page 149.)

PAULSON & Son, Thomas, 97 Second Ave., Brooklyn, N. Y.
(See page 731.)

PFAU Mfg. Co., Mentor & Huston Aves., Cincinnati, O.

PHOSPHOR Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. "Elephant."
(See page 331.)

PITTSBURG Brass Mfg. Co., 32d St. & Penn Ave., Pittsburg, Pa.

PROGRESSIVE Brass Foundry, Keowee & Herbert Sts., Dayton, O.

PROVIDENCE Brass & Aluminum Foundry, 460 Eddy St., Providence, R. I.

RACINE Aluminum & Brass Foundry Co., 1329 12th St., Racine, Wis.

REEVES & Co., Paul S., 1415-25 Catharine St., Philadelphia, Pa.

RIDER-BAGG Co., 369 Birnie Ave., Springfield, Mass.

RINCON Foundry Co., 349-65 Seventh St., San Francisco, Cal.

ROSTAND Mfg. Co., Milford, Conn.

"S-C" Regulator Co., Fostoria, O.

SAYRE Stamping Co., Sayre, Pa.

SHARP Brass Works, J. C., Boyce & 20th Sts., Chattanooga, Tenn.

SHERWOOD Brass Works, 1167 Jefferson Ave., Detroit, Mich.

SMITH Mfg. Co., A. P., Norman & Lawrence Sts., East Orange, N. J.

SPENCER'S Sons, I. S., Guilford, Conn.

STAATS & Co., Geo., 252 Lorimer St., Brooklyn, N. Y.

STANDARD Brass Foundry Co., 1831 Columbus Rd., N. W., Cleveland, O.

STANDARD Foundry Co., Hartford, Conn.

STERLING Specialty Co., New Comerstown, O.

STILLMAN White Foundry Co., 1 Bark St., Providence, R. I. "Eagle."

THIERY & Kendrick Mfg. Co., Detroit, Mich.
(See page 797.)

TITAN Copper Products Co., Buffalo, N. Y.

TITANIUM Alloy Mfg. Co., Sugar & Lafayette Sts., Niagara Falls, N. Y.

TRIUMPH Electric Co. (Oakley), Cincinnati, O.

TURNER & Seymour Mfg. Co., Torrington, Conn.

UNIQUE Brass Foundry Co., 833-41 Grant St., Buffalo, N. Y.

VANADIUM Metals Co., Vanadium Bldg., Pittsburg, Pa. "Victor."

VICTOR—See Vanadium Metals Co.

WATERBURY Mfg. Co., Waterbury, Conn.

WAUKESHA Foundry Co., Waukesha, Wis.

WELLMAN Bronze Co., 6017 Superior Ave., Cleveland, O.

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Accurate—Dense and True to Specifications

Let us have your prints for estimate. We shall be glad to recommend an alloy suitable for your purpose and give you the benefit of the knowledge gained during our thirty-five years in the mixed metal business.

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Send your blue prints, specifications or samples for our quotations.

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Brooklyn, N. Y.

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DIFFICULT WORK
ACCURACY
QUALITY AND
PROMPT SERVICE

MILWAUKEE, WISCONSIN

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CASTINGS (Continued)

BRONZE AND BRASS CASTINGS (Continued)

WELLS Chemical Bronze Works, Temple & Harding Sts., Worcester, Mass.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

WILLIAMS & Son, E. A., 105-11 Plymouth St., Jersey City, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

DIE CASTINGS

ACME Die-Casting Corp., 35th St. & Third Ave., Brooklyn, N. Y.
(See page 145.)

ALEMITE Metals Co., 341-51 W. Chicago Ave., Chicago, Ill.

AMERICAN Die Casting Co., Vandalia Tracks & White River, Indianapolis, Ind.
(See page 147.)

AMERICAN Die Casting Co. of New York, 39 S. Sixth St., Newark, N. J.

DOEHLER Die-Casting Co., Court & Ninth Sts., Brooklyn, N. Y.
(See page 143.)

FRANKLIN Mfg. Co., 736 Gifford St., Syracuse, N. Y.
(See page 731.)

FRITZ, Perry E., 2939 Sunrise St., Los Angeles, Cal.

GERMANN Bronze Co., 355 W. 19th St., Erie, Pa.

GREY Mfg. Co., C. M., 358 Central Ave., East Orange, N. J.

HARLEY Co., Springfield, Mass.
(See page 851.)

HOYT Metal Co., 300 N. Broadway, St. Louis, Mo.
(See page 145.)

INDIANA Die Casting Co., 11th & Lewis Sts., Indianapolis, Ind.

KIDDER-OSWALD Co., Dayton, O.

LEGLER-EILERMAN Co., Bacon St., Dayton, O.

LIGHT Mfg. & Foundry Co., Pottstown, Pa.
(See page 403.)

LUMEN Bearing Co., Buffalo, N. Y.
(See page opposite Last Page.)

MILWAUKEE Die Casting Co., Milwaukee, Wis.
(See page 145.)

MODERN Die & Tool Co., Indianapolis, Ind. "Victor."
(See page 725.)

MOGUL Metal Co., Detroit, Mich.
(See page 147.)

MUZZY-LYON Co., 149-63 Larned St., W. Detroit, Mich.
(See page 147.)

NATIONAL Lead Co., New York, N. Y.
(See page 153.)

PARKER White Metal & Machine Co., Railroad St., Erie, Pa.
(See page 149.)

PHOENIX Die Casting Co., 21 Illinois St., Buffalo, N. Y.
(See page 867.)

PRECISION Die-Casting Co., Fayetteville, N. Y.

SANFORD Co., David C., 33-39 Drouve St., Bridgeport, Conn.

SARGENT & Co., Water & Wallace Sts., New Haven, Conn.

STEWART Mfg. Co., J. K., Wells St. Bridge, Chicago, Ill.

STROH Die Moulded Casting Co., 161-71 Michigan St., Milwaukee, Wis.

VAN WAGNER Mfg. Co., E. B. Syracuse, N. Y.
(See page 141.)

VEEDER Mfg. Co., 22 Sargeant St., Hartford, Conn.

VICTOR—See Modern Die & Tool Co.

WHITE Brass Casting Co., 1656 Austin Ave., Chicago, Ill.

WING & Co., J. T., 15-19 Woodward Ave., Detroit, Mich.

ZENITE Metal Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

GRAY IRON CASTINGS

ACME Foundry Co., Detroit, Mich.

ADAMITE—See Pittsburgh Iron & Steel Foundries Co.

ADAMS Truck, Foundry & Machine Co., 419-33 W. Main Cross St., Findlay, O.

ADRIAN Steel Casting Co., Adrian, Mich.

ALLYNE-RYAN Foundry Co., Aetna Rd. & E. 91st St., Cleveland, O.

AMERICAN Car & Foundry Co., Detroit, Mich.

AMERICAN Foundry & Mfg. Co., 11th & Herbert Sts., St. Louis, Mo.

AMERICAN Tool & Machine Co., Boston, Mass.

ARNOLD Co., Hoyt St., Norwalk, Conn.

ATLAS Foundry Co., Military St., Detroit, Mich.

AUTO Castings Co., 2088 Scranton Rd., Cleveland, O.
(See page 443.)

BARKER, James, Sixth & Cayuga Sts., Philadelphia, Pa.

BARLOW Foundry Co., 551 N. J. R. R. Ave., Newark, N. J.

BAY City Foundry & Machine Co., Bay City, Mich.
(See page 859.)

BAY View Foundry Co., McDonough, Water & Shelby Sts., Sandusky, O.

BOSTON Casting Co., 18 Pearl St., Boston, Mass.

BYRAM Foundry Co., 921 Biddle St., Indianapolis, Ind.

CAMPBELL, Wyant & Cannon Foundry Co., Muskegon, Mich.
(See page 501.)

CENTRAL Foundry Co., 705-23 Park St., Milwaukee, Wis.

CHENEY & Son, S., Manlius, N. Y.

CONSOLIDATED Castings Co., Mechanicsville, N. Y.

DEAN Mfg. Co., 262 Front St., Newport, Ky

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All of our time and energy is devoted to the production of Motor Bearings.

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Careful Supervision
WITH
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Manganese Bronze
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Copper
Bell Metal
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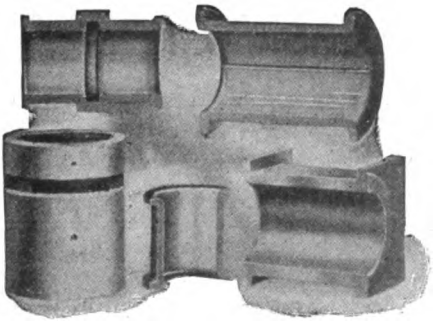

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DIE CASTINGS

Finished Parts Ready for Assembly Die Cast Bearings a Specialty

"American" Die Casting Co.
Vandalia Tracks and White River
Indianapolis, Ind.

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CASTINGS (Continued)

GRAY IRON CASTINGS (Continued)

DETROIT Foundry Co., N. Grand Blvd. & Riopelle St., Detroit, Mich.

EMPIRE Foundry Co., Jersey Ave., New Brunswick, N. J.

ENTERPRISE Foundry Co., 1127-57 E. Warren Ave., Detroit, Mich.

FAIRVIEW Foundry Co., ft. Vanilla Ave., Detroit, Mich.

FANNER Mfg. Co., Brookside Pk., Cleveland O.

FERRO Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

FLAGG & Co., Stanley G., 1421 Chestnut St., Philadelphia, Pa.

FOSTER, Merriam & Co., Meriden, Conn.

FRONTIER Iron Works, 41 Letchworth St., Buffalo, N. Y.

FULTON Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

HALL Gas Engine Mfg. Co., Byesville, O.

HART Foundry Co., 10 Allen St., Lawrence, Mass.

HOLYOKE Motor Foundry Co., Holyoke, Mass.

HOOSIER Castings Co., Connersville, Ind.

ILLINOIS Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill.

INTERSTATE Foundry Co., E. 61st St. & Erie R. R., Cleveland, O.

LAKEY Foundry & Machine Co., First & Water Sts., Muskegon, Mich.

LOGANSPORT Castings Co., Logansport, Ind.

LOVEWELL-HENRICI Co., 936-42 Broadway, Chelsea, Mass.

LUSK Bros., Foundry Co., 809-15 Van Buren St., Jackson, Mich.

LYCOMING Foundry & Machine Co., Williamsport, Pa.
(See page 715.)

McFARLAND Foundry & Machine Co., Trenton, N. J.

MACHINISTS Foundry Co., Tenth St. & Macedonia Ave., Muncie, Ind.

MANUFACTURERS Foundry Co., Waterbury, Conn.
(See page 379.)

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727 and 819.)

MOHN & Kershner, Green St., Reading, Pa.

MOTOR Foundry Co., Detroit, Mich.

MUNCIE Foundry & Machine Co., Muncie, Ind.
(See page 149.)

MURCOTT-DUDEN Co., 253 Broadway, New York, N .Y. (Distributors.)
(See page 867.)

NATIONAL Sewing Machine Co., Belvidere, Ill.

NEW Standard Foundry Co., Detroit, Mich.

NORTMANN-DUFFKE Foundry Co., 27th Ave. & N. W. R. R., Milwaukee, Wis.

PALMER & De Mooy Foundry Co., 1658 Leonard St., Cleveland, O.

PEERLESS Foundry, Hamilton, O.

PEQUONNOCK Foundry, Fifth St. Extension, Bridgeport, Conn.

PITTSBURGH Iron & Steel Foundries Co., Pittsburgh, Pa. "Adamite."

PORTLAND Forge & Foundry Co., Portland, Ind.

RACINE Brass & Iron Co., 1827 Racine St., Racine, Wis.

RACINE Foundry Co., Tenth St. & C., M. & St. P. Ry., Racine, Wis.

REEDY Foundry Co., 4600 Iowa St., Chicago, Ill.

RELIANCE Foundry Co., 16th & North F Sts., Richmond, Ind.

RINCON Foundry Co., 349-65 Seventh St., San Francisco, Cal.

ROMEO Foundry Co., Port Huron, Mich.

SMITH Mfg. Co., A. P., Norman & Lawrence Sts., East Orange, N. J.

SMITH Mfg. Co., Philip, Sidney, O.

SOWERS Mfg. Co., 1800-10 Niagara St., Buffalo, N. Y.

SPENCER'S Sons, I. S., Guilford, Conn.

SPRING City Foundry Co., St. Paul Ave. & State St., Waukesha, Wis.

STA-RITE Engine Co., La Crosse, Wis.

STANDARD Foundry Co., Forest & Kewaunee Sts., Racine, Wis.

STOWELL Mfg. & Foundry Co., South Milwaukee, Wis.

SUSQUEHANNA Casting Co., Wrightsville, Pa.

TRENTON Malleable Iron Co., New York Ave., Trenton, N. J.

TURNER & Seymour Mfg. Co., Torrington, Conn.

UNION Mfg. Co., New Britain, Conn.

URICK Foundry Co., 15th & Cherry Sts., Erie, Pa.

WABASH Foundry Co., Wabash, Ind.

WATERBURY Castings Co., Railroad Hill St., Waterbury, Conn.

WELLER Hdw. & Fdry. Co., Horseheads, N. Y.

WILSON Foundry & Machine Co., Pontiac, Mich.

WISCONSIN Aluminum Foundry Co., Manitowoc, Wis.

WISCONSIN Cylinder Foundry Co., Racine, Wis.

WOLLASTON Foundry Co., (Norfolk Downs), Quincy, Mass.

MALLEABLE IRON CASTINGS

ACME Steel & Malleable Iron Works, 245 Military Rd., Buffalo, N. Y.

ALBION Malleable Iron Co., Albion, Mich.

AMERICAN Malleables Co., Lancaster, N. Y.

ARCADE Malleable Iron Co., Albany St., Worcester, Mass.

BADGER Malleable & Mfg. Co., South Milwaukee, Wis.

BARLOW Foundry Co., 551 N. J. R. R. Ave., Newark, N. J.

BELLE City Malleable Iron Co., 1500 Kewanee St., Racine, Wis.

BOSTON Casting Co., 12 Pearl St., Boston, Mass.

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Muncie, Indiana

High Grade Automobile Cylinder Castings

We will be pleased to submit figures on your requirements

White Metal
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OF
Quality

Parker White Metal and Machine Co.
Railroad Street, ERIE, PA.

AUTOMOBILE CASTINGS

Ohio Malleable Iron Co.,
Columbus, Ohio

Capacity, 75 to 100 tons of reliable castings daily.

Quality—Our castings combine the *Ductility* of wrought iron, the *Accuracy* of drop forgings and *Strength* of cast steel.

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CASTINGS (Continued)

MALLEABLE IRON CASTINGS (Continued)

BUHL Malleable Iron Co., Wight & Adair Sts., Detroit, Mich.

CHISHOLM-MOORE Mfg. Co., Lakeside Ave., & E. 49th St., Cleveland, O.

COLUMBUS Malleable Iron Co., Curtis Ave., Columbus, O.

DANVILLE Malleable Iron Co., E. Fairchild St., Danville, Ill.

DEVLIN Mfg. Co., Thos., Third & Lehigh Aves., Philadelphia, Pa.

EASTERN Malleable Iron Co., Naugatuck, Conn.

ERIE Malleable Iron Co., Erie, Pa.

FANNER Mfg. Co., Brookside Pk., Cleveland, O.

FLAGG & Co., Stanley G., 1421 Chestnut St., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y. (See page 351.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GENERAL Malleable Co., Warren, O.

GLOBE Malleable Iron & Steel Co., Syracuse, N. Y.

HAMMOND Malleable Iron Co., Summer St., Hammond, Ind.

ILLINOIS Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill.

JEWEL Steel & Malleable Co., 373 Hertel Ave., Buffalo, N. Y.

JOHNSON & Co., Isaac G., Spuyten Duyvil, New York, N. Y.

MALLEABLE Iron Fittings Co., Branford, Conn.

MARION Malleable Iron Works, Marion, Ind.

MEEKER Foundry Co., 95 Clay St., Newark, N. J.

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (See page 867.)

NATIONAL Malleable Castings Co., Cleveland, O.

NORTH & Judd Mfg. Co., New Britain, Conn. (See page 835.)

OHIO Malleable Iron Co., Columbus, O. (See page 149.)

PRATT Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill.

PRATT & Letchworth Co., 189 Tonawanda St., Buffalo, N. Y.

RHODE Island Malleable Iron Works, Hills Grove, R. I.

SPRINGFIELD Malleable Iron Co., George St., Springfield, O.

STOWELL Mfg. & Foundry Co., South Milwaukee, Wis.

SYRACUSE Malleable Iron Works, Syracuse, N. Y. (See page 469.)

TERRE Haute Malleable & Mfg. Co., N. 19th St., Terre Haute, Ind.

TRENTON Malleable Iron Co., New York Ave., Trenton, N. J.

UNITED States Malleable Iron Co., Woodville St., Toledo, O.

WESTERN Malleables Co., Beaver Dam, Wis. (See page 691.)

STEEL CASTINGS

ACME Steel & Malleable Iron Works, 346 Military Rd., Buffalo, N. Y.

ADAMITE—See Pittsburgh Iron & Steel Foundries Co.

ADRIAN Steel Castings Co., Adrian, Mich.

ALLISON & Co., Fifth & Market Sts., Chester, Pa.

AMERICAN Steel Foundries, 332 S. Michigan Ave., Chicago, Ill.

AUTO Castings Co., 2088 Scranton Rd., Cleveland, O. (See page 443.)

BESCO—See Buchanan Electric Steel Co.

BETHLEHEM Steel Co., Third & Poplar Sts., South Bethlehem, Pa.

BOSTON Casting Co., 13 Pearl St., Boston, Mass.

BUCHANAN Electric Steel Co., Buchanan, Mich. "Besco."

BUHL Malleable Iron Co., Wight & Adair Sts., Detroit, Mich.

CHESTER Steel Castings Co., Chester, Pa.

CHICAGO Steel Foundry Co., Kedzie Ave. & 37th St., Chicago, Ill.

CINCINNATI Steel Castings Co., Queen City & Spring Grove Aves., Cincinnati, O.

CRUCIBLE Steel Casting Co., Lansdowne, Pa.

CRUCIBLE Steel Castings Co., 612 Clinton St., Milwaukee, Wis.

DAMASCUS Crucible Steel Casting Co., New Brighton, Pa.

DAYTON Steel Foundry Co., Chapel Rd. & C. H. & D. R. R., Dayton, O.

EAGAN-ROGERS Steel & Iron Co., Crum Lynne, Pa.

EASTERN Steel Castings Co., 30 Kemble St., Boston, Mass.

ELECTRIC Steel Co. of Indiana (Speedway City), Indianapolis, Ind.

FARRELL-CHEEK Steel Foundry Co., Sandusky, O.

FIRTH & Son Co., Rowland, Phillipsburg, N. J.

FLAGG & Co., Stanley G., 1421 Chestnut St., Philadelphia, Pa.

FORT Pitt Steel Casting Co., McKeesport, Pa.

GERLINGER Steel Casting Co., 59th St. & National Ave., West Allis, Wis.

HOOSIER Castings Co., Connersville, Ind.

INLAND Steel Casting Co., Terra Haute, Ind.

JEWEL Steel & Malleable Co., 373 Hertel Ave., Buffalo, N. Y.

JOHNSON & Co., Isaac G., Spuyten Duyvil, New York, N. Y.

KRUPP—See Prosser & Son.

LEBANON Steel Foundry, Front & Lehman Sts., Lebanon, Pa.

MALLEABLE Iron Fittings Co., Branford, Conn.

MAYNARD Steel Casting Co., 710-16 Reed St., Milwaukee, Wis.

MESTA Machine Co., Pittsburgh, Pa.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.) (See pages 547, 727 and 819.)

MICHIGAN Steel Casting Co., Detroit, Mich. (See page 151.)

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CASTINGS (Continued)

STEEL CASTINGS (Continued)

MILBURY Steel Foundry Co., Milbury, Mass

MILWAUKEE Steel Foundry Co., S. Water & Virginia Sts., Milwaukee, Wis.

MONARCH Steel Castings Co., Detroit, Mich.

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (Distributors.) (See page 867.)

NATIONAL Malleable Castings Co., Cleveland, O.

NATIONAL Steel Casting Co., Montpelier, Ind.

NATIONAL Steel Foundries, ft. Belleview Pl., Milwaukee, Wis.

PITTSBURGH Iron & Steel Foundries Co., Pittsburgh, Pa. "Adamite."

PRATT & Letchworth Co., 189 Tonawanda St., Buffalo, N. Y.

PRIME Steel Co., 674 Kinnickinnic Ave., Milwaukee, Wis.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

PYRO—See Swedish Crucible Steel Co.

RACINE Steel Castings Co., Racine, Wis.

READING Steel Casting Co., Reading, Pa.

RIVERSIDE Steel Casting Co., Newark, N. J.

SIVYER Steel Casting Co., 37th & Mitchell Sts., Milwaukee, Wis.

SMITH Steel Castings Co., Geo. H., 500 Clinton St., Milwaukee, Wis.

STANDARD Steel Castings Co., Cleveland, O.

STOCK Process Steel Co., Detroit, Mich.

STRONG Steel Foundry Co., Hertel Ave. & Norris St., Buffalo, N. Y.

SWEDISH Crucible Steel Co., Detroit, Mich. "Pyro."

TAYLOR-WHARTON Iron & Steel Co., High Bridge, N. J.

TECO—See Treadwell Engineering Co.

TOLEDO Steel Casting Co., Toledo, O.

TREADWELL Engineering Co., Edelman & Lennox Sts., Easton, Pa. "Teco."

UNION Steel Casting Co., Bartlett Sq. (Jamaica Plain), Boston, Mass.

WARREN Steel Casting Co., Lyon & Dorcas Sts., St. Louis, Mo.

WEHR Steel Co., 45th & Gordon Aves., West Allis, Wis.

WEST Steel Casting Co., 305-13 E. 70th St., Cleveland, O.

WHITELEY Steel Co., 103½ Jefferson St., Muncie, Ind.

WHITMAN Co., A. P., Fourth & Booth Sts., Chester, Pa.

CASTORS

CASTORS AND WHEEL TRUCKS

(See also Turntables, Automobile)

AUTOMOBILE Accessories Co., 816 W. North Ave., Baltimore, Md. "Norwood." (See page 681.)

NORWOOD—See Automobile Accessories Co.

WEBER Automobile Supply Co., 6 E. Kiowa St., Colorado Springs, Colo.

CATCHES

SPRING CABINET CATCHES AND FASTENERS

BRAINERD Mfg. Co., East Rochester, N. Y.

BRASS Goods Mfg. Co., 380 Nevins St., Brooklyn, N. Y.

BURNS & Bassick Co., Bridgeport, Conn. (See page 211)

CORBIN Cabinet Lock Co., New Britain, Conn.

SARGENT & Co., Water & Wallace Sts., New Haven, Conn.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

CELLULOID

SHEET CELLULOID

(For windows in curtains and storm fronts)

ARLINGTON Co., 725-27 Broadway, New York, N. Y. "Pyralin." (See page 535.)

CELLULOID Co., 30 Washington Pl., New York, N. Y.

FIBERLOID Co., 55 Fifth Ave., New York, N. Y.

PYRALIN—See Arlington Co.

CEMENT

CAST IRON CEMENT

(For repairing cracks in castings)

BRAND Co., S. H., 559 W. Lake St., Chicago, Ill.

CENTRAL Foundry Supply Co., St. Clair Ave. & P. R. R., Columbus, O.

CLARK Cast Steel Cement Co., Shelton, Conn. "Steamtite."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. (See page 725.)

SMOOTH-ON Mfg. Co., 572-74 Communipaw Ave., Jersey City, N. J.

STEAMTITE—See Clark Cast Steel Cement Co.

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

WONDER WORKER—See Hall-Thompson Co.

CELLULOID CEMENT

(For repairing curtain lights)

AUTO Products Co., 5739 Elmer St., Pittsburg, Pa.. "Cellu-Fix."

CELLU-FIX—See Auto Products Co.

Complete Index to Classification appears on Pages 8 to 27.

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Pressure Die Castings

We offer to automobile manufacturers perfectly reliable Babbitt Metal of the highest efficiency, either in the form of ingots or in pressure die castings.

The latter are dense, free from blowholes and of the same quality which has made our Phoenix Metal the standard of comparison wherever high-grade Babbitt Metal is required.

For users of the lower grades of metal we have suitable compositions at the right price.

Write our nearest office for further information and bear especially in mind the superiority of our Pressure Die Castings.

NATIONAL LEAD COMPANY

New York **Boston** **Buffalo** **Chicago**
Cincinnati **Cleveland** **Pittsburg** **St. Louis**

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CEMENT (Continued)

GASKET CEMENT

BENOIT, Constant A., 12-14 Jerome Ave., Brooklyn, N. Y. "Permatex."

PERMATEX—See Benoit, Constant A.

STONE Mfg. Co., 136 Liberty St., New York, N. Y. "Tenox."

TENOX—See Stone Mfg. Co.

RADIATOR REPAIR CEMENT

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill.
(See page 177.)

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

BENOIT, Constant A., 12-14 Jerome Ave., Brooklyn, N. Y. "Permatex."

BLUE RIBBON—See International Metal Polish Co.

BOYER Chemical Laboratory Co., 11 W. Austin Ave., Chicago, Ill.

CHECK—See O-K Auto Supply.

CORONUM Equipment Co., 110 Fulton St., New York, N. Y.

CRUM Mfg. Co., 120 N. Main St., Ottawa, Kans. "Radi-No-Leak."

CUMINGS Bros., Flint, Mich. "Stoppit."

DANBURY Chemical Co., 59 Maple Ave., Danbury, Conn.

DELPHI Auto Specialty Co., Delphi, Ind.

DIAMOND Specialty Co., Indianapolis, Ind.

DRY Co., Harry S., 170 W. Oley St., Reading, Pa.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie," "German."
(See pages 189 to 192.)

GERMAN—See Durkee-Atwood Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

INTERNATIONAL Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

J-M LEAK-NO—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M "Leak-No."

JONES Auto Supply Co., 25th St. & Broadway, Oakland, Cal. "Stop-A-Leak."

LUBRO Oil Co., 116 Prospect Ave., N. W., Cleveland, O.

MET-L-TITE—See Royal Mfg. Co.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis.

NATIONAL Metal Radio Compound Co., Fort Dodge, Ia. "Radio."
(See page 177.)

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill.

NORTHWESTERN Chemical Co., Marietta, O. "Se-Ment-Ol."
(See pages 172 and 173.)

O-K Auto Supply, Blackwell, Okla. "Check."

PANTHER—See B. A. T. Co.

PERMATEX—See Benoit, Constant A.

RADI-NO-LEAK—See Crum Mfg. Co.

RADICO Mfg. Co., 398 Bridge St., Springfield, Mass.

RADIO—See National Metal Radio Compound Co.

RIE-NIE—See Durkee-Atwood Co.

ROYAL Mfg. Co., Hill & Halsey Sts., Newark, N. J. "Met-L-Tite."

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y. "Sta-Fix."
(See page 285.)

SE-MENT-OL—See Northwestern Chemical Co.

SHONDELL Mfg. Co., Napoleon, O.

STA-FIX—See Rub-On Mfg. Co.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STOP-A-LEAK—See Jones Auto Supply Co.

STOPPIT—See Cumings Bros.

SURESEAL Mfg. Co., 9 Centre St., Auburn, Me.

VAN CLEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VULTITE Rubber Co., Bridgeport, Conn.
(See page 797.)

WONDER WORKER—See Hall-Thompson Co.

"X" Laboratories, 630 Washington St., Boston, Mass.

Z & A Mfg. Co., Hazelton, N. Dak.

TIRE REPAIR CEMENT

ACME Supply Co., Ionia, Mich.

ALLIANCE Rubber Co., Alliance, O.
(See page 845.)

AMERICAN Rubber & Tire Co., 70-78 Beach St., Akron, O. "Stickfast."

ANCHOR—See National Cement & Rubber Co

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill.

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Tire-Doh."
(See page 177.)

BESTYET—See St. Louis Rubber Cement Co.

BLUE Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
(See page 685.)

COX, David H., Chestnut St., Roselle, N. J.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

DUTCH—See Van Cleef Bros.

ECLIPSE Cement & Blacking Co., 1238 Belmont Ave., Philadelphia, Pa.

ENDURANCE Tire & Rubber Co., New Brunswick, N. J.

EUREKA Cement Co., 2-6 Ave. A., Newark, N. J.

EVER RIGHT—See Fry, Keyser.

FIRESTONE Tire & Rubber Co., Akron, O.

FRY, Keyser, 616-22 N. Eighth St., Reading, Pa. "Ever Right."

GEM City Liquid Vulcanizer Co., 916 E. Third St., Dayton, O. "U-Vulk."

GENERAL Tire & Rubber Co., Akron, O.
(See page 531.)

GOODRICH Co., B. F., Akron, O. "Titan."

GOODYEAR Tire & Rubber Co., Akron, O.

GRAY Specialty Co., 148 Avon Ave., Newark, N. J.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

Complete Index to Classification appears on Pages 8 to 27.

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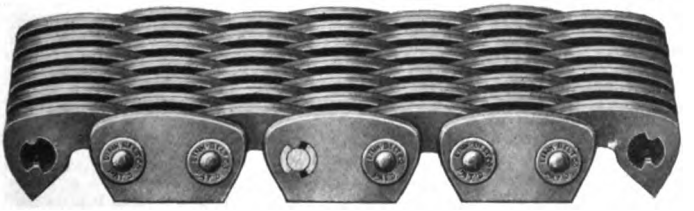
SILENT

MOTOR designers have satisfied themselves by study at our Silent Chain plants that accuracy in manufacture is an actuality—that in installing

Link-Belt Silent Chain

they are using a device that will function properly with the finest adjustments of the motor.

Tests on the block, and in touring, have shown that Link-Belt Silent Chain not only does its work well but retains its accuracy and high efficiency throughout the life of the motor.



Look for the Name on the Washers; Look for the Liners in the Joints

The secret of the success of Link-Belt Silent Chain is due to its patented Pin-Bushed-Joint construction—a round pin and two case-hardened semi-circular bushings—found in no other chain.

We offer our services in assisting designers and builders of automobile motors, on layouts involving the use of Silent Chain Drives for all functions on automobile engines.

LINK-BELT COMPANY

Detroit: 732 Dime Bank Building
Philadelphia: Nicetown Station

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CEMENT (Continued)

TIRE REPAIR CEMENT (Continued)

HAZEN-BROWN Co., 430 Court St., Brockton, Mass. "Hazenoid."

HAZENOID—See Hazen-Brown Co.

JACKSON-ENO Rubber Co., 1010 S. Main St., Los Angeles, Cal. "J. E."

J. E.—See Jackson-Eno Rubber Co.

K & W Rubber Co., Orange St., Ashland, O.

LICKWID Tyre Tonic Co., 1935-37 S. 19th St., Philadelphia, Pa.

LION Liner Co., 1219 N. Eighth St., Sheboygan, Wis.

M. & M. Mfg. Co., Miami St., Akron, O.

MANHATTAN Rubber Mfg. Co., Passaic, N. J.

MATTSON Rubber Co., Lodi, N. J.
(See page 827.)

MICHELIN Tire Co., Milltown, N. J.
(See Inside Back Cover.)

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

MILLER Rubber Co., Akron, O.

MOTOR Supplies Mfg. Co., 21 Fifth St., N. E., Minneapolis, Minn. "Perma-Tite."

NAM-TAY—See Yatman Rubber Co.

NARCO—See National Rubber Co.

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O. "Red Cross," "Anchor," "Pioneer."

NATIONAL Rubber Co., 4409 Papin St., St. Louis, Mo. "Narco."

P. P. & B.—See St. Louis Rubber Cement Co.

PEERLESS Cement Co., 39 Viaduct, Akron, O.

PERMA-TITE—See Motor Supplies Mfg. Co.

PIONEER—See National Cement & Rubber Co.

PORTAGE Rubber Co., Barberton, O.

PREMIUM—See Blue Ribbon Mfg. Co.

QUAKER City Rubber Co., Philadelphia, Pa.
(See page 839.)

RED CROSS—See National Cement & Rubber Co.

REPUBLIC Rubber Co., Youngstown, O.

RIE-NIE—See Durkee-Atwood Co.

S-V—See Williams Mfg. Co.

ST. LOUIS Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "P. P. & B.," "Bestyet."

SELF-VULCANIZING Rubber Works, Morristown, N. J. "Vulcanizit."

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STICKFAST—See American Rubber & Tire Co.

STOPPIT—See Cumings Bros.

TINGLEY & Co., Chas. O., Rahway, N. J.

TIRE-DOH—See Atlas Auto Supply Co.

TITAN—See Goodrich Co.

U-VULK—See Gem City Vulcanizer Co.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

VAN Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill. "Dutch."

VITALIC—See Continental Rubber Works.

VULCANIZIT—See Self-Vulcanizing Rubber Works.

VULTITE Rubber Co., Bridgeport, Conn.
(See page 797.)

WILLIAMS Mfg. Co., 18th & Carman Sts., Camden, N. J. "S-V."

WONDER WORKER—See Hall-Thompson Co.

YATMAN Rubber Co., 267-69 Mt. Pleasant Ave., Newark, N. J. "Nam-tay."

YOUNG, Orlando W., 180 Sherman Ave., Newark, N. J.

CHAIN

TRANSMISSION OR DRIVING CHAIN

AMERICAN High Speed Chain Co., Indianapolis, Ind.

BALDWIN Chain & Mfg. Co., Worcester, Mass.
(See page 663.)

BRAMPTON—See Miller, Chas. E.

COVENTRY—See Funke Co.

CULVER-TAYLOR Chain Works, 140 Madison Ave., Detroit, Mich.

DIAMOND Chain & Mfg. Co., 231 W. Georgia St., Indianapolis, Ind.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (Importers.) "Renold."
(See page 491.)

FUNKE Co., Herbert F. L., 118 Broad St., New York, N. Y. (Importers.) "Coventry."
(See page 693.)

LINK-BELT Co., 732 Dime Bank Bldg., Detroit, Mich.
(See page 155.)

MILLER, Chas. E., 97 Reade St., New York, N. Y. (Importer.) "Brampton."

MORSE Chain Co., Dept. R., Ithaca, N. Y.
(See page 407.)

RENOLD—See Frasse & Co.

WHITNEY Mfg. Co., Hartford, Conn.
(See page 723.)

CHAINS

NON-SKID CHAINS OR GRIPS

(For other Anti-Skid Devices—See Bands, Non-Skid; also Treads, Detachable)

AMERICAN Chain Co., Bridgeport, Conn. "Lyon," "Rid-O-Skid," "Weed."
(See page 157.)

B. B.—See Fulton Co.

BAY State Transportation Co., Fall River, Mass.

BRO-GOR—See Brockett-Gorham Co.

BROCKETT-GORHAM Co., N. State St., Marion, O. "Bro-Gor."

BRUNTON Specialty Co., 110-12 N. Court St., Cincinnati, O.

CLEVELAND Chain & Mfg. Co., Cleveland, O.

D-M—See Dayton Malleable Iron Co.

DAYTON Malleable Iron Co., Dayton, O. "D-M."

EASYON—See Leather Tire Goods Co.

EMERGENCY—See Gemco Mfg. Co.

FRANKLIN Auto Shoe Co., Pendleton, Ind.

FULTON Co., 708-10 National Ave., Milwaukee, Wis. "B. B."
(See page 695.)

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Dobbins Blow-Out Chains

Patented June 18, 1912, and June 24, 1913.

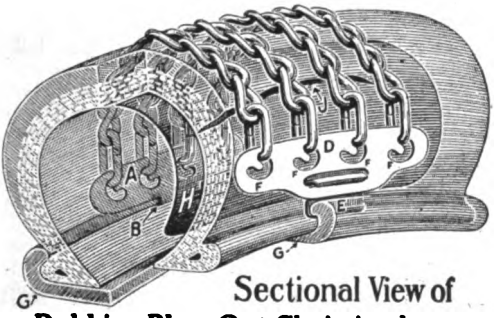
They reinforce the shoe and hold the worst blow-out so securely that it becomes the strongest part of the tire

GIVEN the severest tests—500-mile runs with the worst sort of blow-outs—over rocks, through deep sand, mud and snow—Dobbins Blow-Out Chains always "made good." They securely held a very badly blown-out tire on a car that was stalled in a river bed partly made up of quicksand, and a careful examination failed to reveal a particle of sand or moisture between the shoe and the inner tube.

These tests proved that Dobbins Blow-Out Chains actually "sand and water proof" the compartment between the patch and the tube, and places the device in a class by itself.

Dobbins Blow-Out Chains are made in two styles: For Clincher and Straight-Side Tires. With each Chain is packed an inner patch that is to be placed directly over the hole or cut, on the inside of the shoe, with the sticky side next to the casing. Full directions packed with each chain. They are easily attached.

A—Main Plate
B—Bent Lip on Main Plate
D—Second Plate
E—Auxiliary Hook



F—Curved Slots permitting adjustment for due amount of tension
G—Rim of wheel
H—Inner Patch placed inside of shoe
J—Blow-out

Sectional View of
Dobbins Blow-Out Chain in place

Price List of Dobbins Blow-Out Chains

(Including Inner Patch)

$1.00	each	for	3-inch	tires		$1.50	each	for	4½-inch	tires.
1.00	"	"	3½	"	"	1.75	"	"	5	" "
1.50	"	"	4	"	"	1.75	"	"	5½	" "

$1.75 each for 6-inch tires.

Dealers: Put in a stock of Dobbins Blow-Out Chains, now.
Ask your jobber or write us direct.

American Chain Company, Inc., Bridgeport, Conn.

Sole Manufacturers of Weed Tire Chains

Also Manufacturers of Tire Chains especially constructed for Single and Dual Solid Truck Tires—Motorcycle Tire Chains, Weed Chain-Jacks, Etc.

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CHAINS (Continued)

NON-SKID CHAINS OR GRIPS (Continued)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Emergency."
(See page 127.)

GRIPPER—See Huffman Mfg. Co.

GRUS Leaf Spring Oiler Co., 1536 Michigan Ave., Chicago, Ill.

HERMAN Mfg. Co., 1420 Pennsylvania Ave., Washington, D. C.

HUFFMAN Mfg. Co., Youngstown, O. "Gripper."

K-L—See Kingsbury-Leahy Co.

KINGSBURY-LEAHY Co., 131-33 Hudson Ave., Albany, N. Y. "K-L."
(See page 107.)

LEATHER Tire Goods Co., Niagara Falls, N. Y. "Easyon."
(See pages 82 and 83.)

LYON—See American Chain Co.

McKINNON Chain Co., 250 Amherst St., Buffalo, N. Y.

NEVER-SKID Mfg. Co., 122 Liberty St., New York, N. Y.
(See page 705.)

PROTEX Co., 1790 Broadway, New York, N. Y.

RID-O-SKID—See American Chain Co.

STANDLEY Skid Chain Co., Boone, Ia.

UNIT Chain Co., South Penn Square Bldg., Philadelphia, Pa.

UPTOU Co., Curwensville, Pa.

WEED—See American Chain Co.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn.
(See page 685.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

HARRISBURG Stamping Co., Harrisburg, Pa. "Lightning."

HERZ & Co., 245 W. 55th St., New York, N. Y.
(See page 389.)

HUDSON Hose Mender Co., Melrose, Mass.

IDEAL—See Metal Stamping Co.

IDEAL Clamp Mfg. Co., 200 Bradford St., Brooklyn, N. Y.
(See page 667.)

LIGHTNING—See Harrisburg Stamping Co.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Ideal."

MORGAN Mfg. Co., John St., Newport, R. I.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NEWARK Stamping & Foundry Co., Newark, O. "Thompson."

R. A. B.—See Beaudette & Co.

SCHRADER'S Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y.
(See page 255.)

SCHWIER Mfg. Co., H. F., Boydell Bldg., Detroit, Mich. "Scott."

SCOTT—See Schwier Mfg. Co.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

THOMPSON—See Newark Stamping & Foundry Co.

YERDON, Wm., Main & Center Sts., Fort Plain, N. Y.

CHANNELS

PRESSED STEEL CHANNELS

(See Frames, Pressed Steel)

CHECKS

CLUTCH CHECKS

SCHOOLER Co., O. E., Webb City, Mo.

STEERING GEAR CHECKS

LITTLE STEERSMAN—See Modern Auto Appliance Co.

MODERN Auto Appliance Co., Chatham, N. Y. "Little Steersman."

CLAMPS

HOSE CLAMPS

AMERICAN Stamping Co., Battle Creek, Mich.

BEAUDETTE & Co., R. A., Chippewa Falls, Wis. "R. A. B."

CATELAIN, A., 1446-48 Indiana Ave., Chicago, Ill.

CRABILL Hose Clamp Co., Battle Creek, Mich.

ELK Mfg. Co., 1926 Broadway, New York, N. Y.

SPRING REPAIR CLAMPS

BUCKEYE—See Central Brass & Fixture Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

KANTALEVER—See Motor Car Equipment Co.

MOTOR Car Equipment Co., 21 W. 62d St., New York, N. Y. "Kantalever."
(See page 809.)

WIRE ROPE CLAMPS

BRODERICK & Bascom Rope Co., 817 N. Second St., St. Louis, Mo.

BULL DOG—See Lamson & Sessions Co.

HAZARD Mfg. Co., 81 E. Ross St., Wilkes-Barre, Pa.

LAMSON & Sessions Co., 2133 Scranton Rd., Cleveland, O. "Bull Dog."

LANZ & Sons, Mathew, 2907 Carson St., Pittsburgh, Pa.

LESCHEN & Sons Rope Co., A., 920 N. First St., St. Louis, Mo.

MACOMBER & Whyte Rope Co., 507-09 S Clinton St., Chicago, Ill.

ROEBLINGS Sons Co., John A., Trenton, N. J.

TRENTON Iron Co., Trenton, N. J.

UNION Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.

WILCOX, Crittenden & Co., 33 Main St., Middletown, Conn.

Complete Index to Classification appears on Pages 8 to 27.

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MODEL FA

HARTFORD SELF WINDING ELECTRIC CLOCK

This is the clock for you to sell because it is the only electrically operated and controlled clock that has met the exacting conditions for which it was made.

It finds a ready sale with motorists everywhere, because—

It is dependable and accurate.

It is always on the job—day and night.

It requires no attention after installing.

No keys are required—neither does it have to be taken apart to wind.

Attached to any storage battery or four No. 6 dry cells—it winds itself.

It is immune to the effects of vibration, heat, dust and cold.

It is high grade in every respect.

The electrical attachment is simple and cannot get out of order.

The Hartford is made in two types.

Model FA—Flush type.

Model XA—Extended type.

Either model in all nickel or black, with black or silver dials.

Price, $10.00.

Dealers and jobbers—write for folders and discounts.

THE HARTFORD CLOCK CO., Inc. 6 Church St., N. Y. City

MODEL XA

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CLEANERS

ACETYLENE BURNER CLEANERS

BARNARD Specialty Co., 3300 Maple Ave., Los Angeles, Cal.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

FABRIC CLEANERS

PERCAMA—See Perkins Campbell Co.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Percama." (See page 207.)

GLASS WIND SHIELD CLEANERS

AMERICAN Ball Co., 115 Clifford St., Providence, R. I. "Seeclear."

CLEAR-O-SCOPE Co., 740 W. Madison St., Chicago, Ill.

CLEAR Vision Cleaner Co., 1790 Broadway, New York, N. Y.

E. G.—See Grossman Mfg. Co.

EVERGOOD—See Grossman Mfg. Co.

GABRIEL Mfg. Co., 1407 40th St., N. E., Cleveland, O.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "Security," "E. G.," "Evergood." (See page 829.)

OUTLOOK Co., 5516 Euclid Ave., Cleveland, O.

SECURITY—See Grossman Mfg. Co.

SEECLEAR—See American Ball Co.

CLEATS

FIBRE WIRING CLEATS

(See also Fibre, Hard)

AMERICAN Vulcanized Fibre Co., 585-95 Equitable Bldg., Wilmington, Del. (See page 225.)

BLAKE Signal & Mfg. Co., 251 Causeway St., Boston, Mass.

CONTINENTAL Fibre Co., Newark, Del. (See page 171.)

DIAMOND State Fibre Co., Elsmere, Del.

NATIONAL Fibre & Insulation Co., Wilmington, Del.

SPAULDING & Sons Co., J., Wheeler St., Tonawanda, N. Y.

STANDARD Fibre Co., 11-15 Miller St., Somerville, Mass.

WILMINGTON Fibre Specialty Co., Wilmington, Del. (See page 225.)

CLIPS

CURTAIN CLIPS

(For attaching curtains to wind shields and bow sockets)

STANDARD Top & Equipment Co., 1212 Huron Rd., Cleveland, O. "Swan."

SWAN—See Standard Top & Equipment Co.

SPRING CLIPS

(See also Forgings, Drop)

CLAPP Mfg. Co., E. D., 305 Genesee St., Auburn, N. Y.

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

ECCLES Co., Richard, Auburn, N. Y.

SEWARD & Son Co., M., Grant Sq., New Haven, Conn.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

UNION Forging Co., Union, N. Y. (See page 787.)

WILCOX Mfg. Co., D., Mechanicsburg, Pa.

TRIMMERS CLIPS

BUSER-POSTON Tufting Machine Co., Chillicothe, O. (See page 821.)

MEYER & Co., John C., Lowell, Mass.

CLOCKS

ELECTRICALLY WOUND CLOCKS

BOSTON Clock Co., 16 State St., Boston, Mass. (See page 163.)

HARTFORD Clock Co., 6 Church St., New York, N. Y. (See page 159.)

STEWART-WARNER Speedometer Corp., Chicago, Ill. (See page 461.)

THOMPSON Electric Clock Co., 3 S. Main St., Memphis, Tenn.

HAND WOUND CLOCKS

(See also Holders, Watch)

AERO—See New Haven Clock Co.

ARCADIA—See Waterbury Clock Co.

BOSTON Clock Co., 16 State St., Boston, Mass. (See page 163.)

CHELSEA Clock Co., 16 State St., Boston, Mass. (See page 163.)

DEVERE—See New Haven Clock Co.

DIDISHEIM & Bro., Hipp, 54 Maiden Lane, New York, N. Y. "Octava."

DUANE—See New Haven Clock Co.

FLORIDA—See Waterbury Clock Co.

KEYLESS Auto Clock Co., 246 W. 59th St., New York, N. Y.

NEBO—See New Haven Clock Co.

NEW Haven Clock Co., New Haven, Conn. "New Ormond," "Duane," "Devere," "Aero," "Nebo."

Complete Index to Classification appears on Pages 8 to 27.

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"Is there a clock on this car?"

The automobile salesman is asked this question every day. If he is forced to answer "no"—and then explain—he has cause to feel uneasy. He knows that his most successful competitors call a car "completely equipped" only when it carries an automobile clock.

Waltham
—the only
Automobile Clock
that keeps accurate time all the time

There could be no better proof of the Waltham's accuracy and beauty of appearance than the fact that these cars include it in their regular equipment:

Brewster
Cadillac
Cole
Crane
Detroit Electric
Franklin
Haynes
Locomobile
Lozier
Marmon
Owen Magnetic
Packard
Pierce-Arrow
Rauch & Lang
Rolls-Royce
Simplex
Stearns
Winton

WALTHAM WATCH COMPANY, WALTHAM, MASS.

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CLOCKS (Continued)

HAND WOUND CLOCKS (Continued)

NEW ORMOND—See New Haven Clock Co.

OCALA—See Waterbury Clock Co.

OCTAVA—See Didisheim & Bro.

ORLANDO—See Waterbury Clock Co.

PALATKA—See Waterbury Clock Co.

PECK-HAMRE Mfg. Co., Berlin, Wis.

PENSACOLA—See Waterbury Clock Co.

SESSIONS Clock Co., Forestville, Conn. (See page 751.)

SUWANEE—See Waterbury Clock Co.

TAMPA—See Waterbury Clock Co.

TARPON—See Waterbury Clock Co.

WALTHAM Watch Co., Waltham, Mass. (See page 161.)

WATERBURY Clock Co., Waterbury, Conn. "Florida," "Pensacola," "Tampa," "Ocala," "Suwanee," "Tarpon," "Arcadia," "Orlando," "Palatka."

WESTCLOX—See Western Clock Co.

WESTERN Clock Co., La Salle, Ill. "Westclox."

CLOTH

ENAMELED CLOTH

ACME Rubber Mfg. Co., Trenton, N. J.

AMERICAN Rubberfelt Co., 2215 Elston Ave., Chicago, Ill. "Arco."

ARCO—See American Rubberfelt Co.

BAYONNE—See Boyle & Co.

BOYLE & Co., John, 112-14 Duane St., New York, N. Y. "Bayonne."

CHANDLER Oil Cloth & Buckram Co., East Taunton, Mass.

COOK'S Linoleum Co., Trenton, N. J.

HEATH & Son, Edmund F., Newark, N. J.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

MERITAS—See Standard Oil Cloth Co.

MONARCH Rubber & Oil Cloth Co., Drexel Bldg., Philadelphia, Pa.

POTTER Sons & Co., Thomas, Second & Erie Sts., Philadelphia, Pa.

STANDARD Oil Cloth Co., 320 Broadway, New York, N. Y. "Meritas."

MOHAIR CLOTH

BARRELL Co., Wm. L., New York, N. Y. "Zama." (See page 319.)

BULL DOG—See Mutty Co.

CARR Co., F. S., 31 Beach St., Boston, Mass. (See page 165.)

CHASE & Co., L. C., Boston, Mass. (See page 313.)

HAARTZ, J. C., 136 Federal St., Boston, Mass.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

MUTTY Co., L. J., Boston, Mass. "Bull Dog." (See page 271.)

PICKENS Auto Cloth Co., 1777 Broadway, New York, N. Y. (Importers.)

SCHERER & Co., H., Detroit, Mich.

ZAMA—See Barrell Co.

RUBBER CLOTH

ACME Rubber Mfg. Co., Trenton, N. J.

BULL DOG—See Mutty Co.

CARR Co., F. S., 31 Beach St., Boston, Mass. "Neverleek" (See page 165.)

CHASE & Co., L. C., Boston, Mass. "Drednaut." (See page 313.)

COOK'S Linoleum Co., Trenton, N. J.

DREDNAUT—See Chase & Co.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

FAIRFIELD Rubber Co., Fairfield, Conn.

HAARTZ, J. C., 136 Federal St., Boston, Mass.

HEATH & Son, Edmund F., Newark, N. J.

HODGMAN Rubber Co., 206 Broadway, New York, N. Y.

INTERNATIONAL Rubber Co., 225 Fifth Ave., New York, N. Y. (See page 799.)

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MONARCH Rubber & Oil Cloth Co., Drexel Bldg., Philadelphia, Pa.

MUTTY Co., L. J., Boston, Mass. "Bull Dog," "Numotor." (See page 271.)

NEVERLEEK—See Carr Co.

NUMOTOR—See Mutty Co.

UNITED States Rubber Co., Malden, Mass.

UPHOLSTERY CLOTH

(See Broadcloth; also Silk; also Whipcord)

WIRE CLOTH

(For use in Strainers, Horn Screens, etc.)

BUFFALO Wire Works Co., 320 Terrace, Buffalo, N. Y.

CLINTON Wire Cloth Co., Clinton, Mass.

DE WITT Wire Cloth Co., 291 Broadway, New York, N. Y.

HOWARD & Morse, 45 Fulton St., New York N. Y. "National."

MICHIGAN Wire Cloth Co., 511 Howard St., Detroit, Mich.

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"CHELSEA"

FLANGE INSET
AND OTHER TYPES

AUTO
CLOCKS

☞ For years, the recognized STANDARD OF EFFICIENCY
☞ Best Autoclock now or ever on the market.
☞ Over 150,000 in active use, many thousands for over ten years and giving excellent satisfaction today

Front Wind and Set Back Wind and Set
Side Wind and Set, and Key Wind

Catalogs on Request **CHELSEA CLOCK CO., 16 State Street, Boston, Mass., U.S.A.**
QUALITY—RELIABILITY and UNEQUALLED SERVICE
Makers of Highest Grade Clocks for Residences, Offices, Clubs, Yachts, Garages, Etc.

"BOSTON" 8-Day High Grade AUTO CLOCKS

Flush Insets, etc. Outside permanent Winding and Setting devices, etc.

A Remarkably Good Clock

Also the (Patented) ELECTRIC AUTO CLOCK
The latest up-to-date Accessory—You don't have to wind it

Adopted for Equipment for high class cars

CATALOGS ON REQUEST

BOSTON CLOCK COMPANY, 16 State St., Boston, Mass.

The ALLEN TIRE CASE

is made of finest quality enamel duck, absolutely waterproof. It gives perfect protection to the spare shoe. Made in all colors, in all sizes and for all style demountable rims and wire wheels.

Lamp Covers	Inner Tube Bags
Tool Box Covers	Knuckle Boots
Trunk Covers	Tire Locks
Radiator Covers	Tire Holders

bearing the name "Allen" are guaranteed highest quality and finest workmanship.

Tire Pressure Gauges are a motoring necessity and all dealers should carry in stock the absolutely accurate and convenient

ALLEN TYROMETER
TIRE PRESSURE GAUGE

The Allen Auto Specialty Co.
1926 Broadway New York
1627 Michigan Ave., Chicago.

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CLOTH (Continued)

WIRE CLOTH (Continued)

NATIONAL—See Howard & Morse.

NEW Jersey Wire Cloth Co., 612 S. Broad St., Trenton, N. J.

TYLER Co., W. S., Superior Ave. & E. 36th St., Cleveland, O.

WRIGHT Wire Co., Worcester, Mass. (See page 437.)

CLOTHING

MOTORISTS CLOTHING

(See also Caps; also Gloves; also Leggings; also Mufflers)

ALL-OVER—See Ohio Overall Co.

AMERICAN Buffalo Robe Co., 1-7 Howell St., Buffalo, N. Y.

AUTO-SHIRT Co., Midland, Md.

AUTOMOBILE Apparel Co., Port Chester, N. Y.

BALLARD & Co., J. O., Malone, N. Y.

BEATS ALL—See Standard Oiled Clothing Co.

BELLE CITY—See Chicago Rubber Clothing Co.

BISHOP Co., J. H., Wyandotte, Mich.

BLAUVELT Knitting Co., 280-84 Plane St., Newark, N. J.

BOYNTON'S Improved Process Oil Clothing Co., Vincent St., Gloucester, Mass.

BRADLEY Knitting Co., Delavan, Wis.

BURLINGTON Blanket Co., Burlington, Wis.

CAMDEN—See Goodrich Co.

CHICAGO Auto Robe Supply Co., 12-16 S. Market St., Chicago, Ill.

CHICAGO Rubber Clothing Co., 1501 Albert St., Racine, Wis. "Belle City."

COOK & Bro., E. C., 1801-45 Carroll Ave., Chicago, Ill.

CROSBY-FRISIAN Fur Co., 571 Lyell Ave., Rochester, N. Y.

DEMMERLE & Co., 116 E. 23d St., New York, York, N. Y.

ELCO—See Loewenberg Co.

ELLSWORTH & Thayer Mfg. Co., 336-40 Broadway, Milwaukee, Wis. "Great Western."

EVERDRI—See Loewenberg Co.

FAVORITE Knitting Mills, 1388 W. Sixth St., Cleveland, O.

FOX, Stiefel & Co., 349 Fifth Ave., New York, N. Y.

FRANKLIN Rubber Co., 134 Federal St., Boston, Mass.

GEM Shirt Co., Fifth & Perry Sts., Dayton, O.

GLOBE Shirt & Overall Co., Main & Pearl Sts., Abingdon, Ill. "Protexall."

GOLLAND Sons & Co., I., 810 Broadway, New York, N. Y.

GOODRICH Co., B. F., Akron, O. "Camden."

GOODYEAR Rubber Co., 787 Broadway, New York, N. Y.

GREAT WESTERN—See Ellsworth & Thayer Mfg. Co.

HALL & Co., R. S., Versailles, O.

HILL Mfg. Co., Richard F., 217-19 High St., Newark, N. J. "Kant Leak."

HODGMAN Rubber Co., 806 Broadway, New York, N. Y.

IMPROVED Mfg. Co., Ashland, O.

JAEGERS S. W. S. Co., 395 Fourth Ave., New York, N. Y.

KANT LEAK—See Hill Mfg. Co.

KENREIGN—See Kenyon Co.

KENYON Co., C., 754 Pacific St., Brooklyn, N. Y. "Kenreign."

KLING Bros. & Co., 411-15 S. Fifth Ave., Chicago, Ill.

LOEWENBERG Co., 58-62 Colden St., Newark, N. J. "Everdri," "Elco."

McKIBBEN, Driscoll & Dorsey, Fifth St. & Broadway, St. Paul, Minn.

MANHATTAN—See Standard Oiled Clothing Co.

MANN Co., Leon, 906 Broadway, New York, N. Y.

MOORE-SMITH Co., 250 Devonshire St., Boston, Mass.

MORAWETZ Co., 317-25 E. Water St., Milwaukee, Wis.

NORMAN Garment Co., 82 Union Sq., New York, N. Y.

OHIO Overall Co., Wooster, O. "All-Over."

PARKER Co., John H., 25 James St., Malden, Mass.

PONTIAC Knitting Co., Pontiac, Mich.

PROTEXALL—See Globe Shirt & Overall Co.

REVILLON Freres, 19 W. 34th St., New York, N. Y.

ROSENWALD & Weil, 500 Franklin St., Chicago, Ill.

RUSZITS Fur Co., John, 7 E. 48th St., New York, N. Y.

SANDERS Co., 218½ Indiana Ave., Indianapolis, Ind.

SCOTT & Co., 340 Washington St., Boston, Mass.

SHANHOUSE & Sons, W., Rockford, Ill.

STANDARD Oiled Clothing Co., 152d St. & Tinton Ave., New York, N. Y. "Beats All," "Manhattan."

STROH'S Detroit Overall Co., Detroit, Mich.

TOPLITZ, George, 11 E. 22d St., New York, N. Y.

TOWER Co., A. J., 24 Simmons St., Boston, Mass.

UPTHEGROVE Sporting Goods Co., Valparaiso, Ind.

WALLACE Co., Hugh, 2626 E. Grand Blvd., Detroit, Mich.

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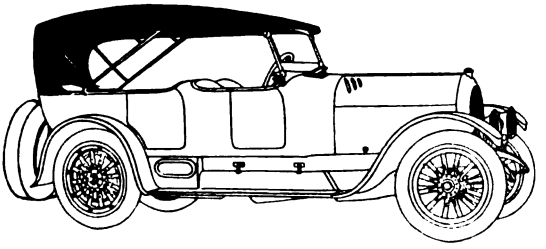

Reputation for Style

It will be apparent to anyone acquainted with motor cars that a top material used as standard equipment on the following cars must have abundant merit. Neverleek is chosen by the manufacturers of these cars because it contributes to style as well as service quality:

National	Peerless
Mercer	Premier
Franklin	F.I.A.T.
Stutz	Cole
King	H.A.L. "Twelve"
Owen Magnetic	Abbott-Detroit "Eight"
Scripps-Booth	Daniels
Stearns-Knight "Eight"	Jeffery "Six"
Pathfinder	Cunningham
Madison	Standard
Ross	Lexington-Howard

Neverleek Top Material has been on the market less than four years. In that time it has gained leadership by sheer force of quality. It is the material made especially to meet the strenuous demands of motor car use and retain its richness and beauty through long service.

Samples of Neverleek in different grains and finishes, together with an interesting booklet, will be mailed to any address on request.

F. S. Carr Company

31 Beach Street, Boston, Mass. **969 Woodward Avenue, Detroit**

Factories at Framingham, Mass., and Granby, Canada

NEVERLEEK

Top Material

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CLUTCHES

AUTOMOBILE FRICTION CLUTCHES

AUTO Engineering Co., Detroit, Mich. "Universal."
(See page 167.)

BORG & Beck Co., Moline, Ill.
(See page 171.)

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

COTTA Gear Co., 117-29 Morgan St., Rockford, Ill.

DETROIT Standard Gear Co., 742 Woodbridge St., E., Detroit, Mich.

FULLER & Sons Mfg. Co., Kalamazoo, Mich.

HARTFORD Auto Parts Co., Hartford, Conn.
(See page 863.)

HELE-SHAW—See Merchant & Evans Co.

HILLIARD Clutch & Machinery Co., 104 W. Fourth St., Elmira, N. Y.

HOOSIER Auto Parts Co., Muncie, Ind.

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

MECHANICS Machine Co., Ninth St. & 19th Ave., Rockford, Ill.
(See pages 300 and 301.)

MERCHANT & Evans Co., Philadelphia, Pa. "Hele-Shaw."
(See page 405.)

POSITIVE Clutch Co., 1345 Rawson St., Chicago, Ill.

TRIO Mfg. Co., 1192-1206 Bellevue Ave., Detroit, Mich.

UNIVERSAL—See Auto Engineering Co.

VERGES Mfg. Co., 518 Prairie St., Milwaukee, Wis.

WABASH Gear Works, Tenth & Farrington Sts., Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind.
(See page 315.)

COATS

AUTOMOBILE COATS

(See Clothing, Motorists)

COCKS

SPRING KEY COCKS

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

BRASS Products Co., 1067 Palmer Ave., E., Detroit, Mich.

CRUM-WILEY Mfg. Co., Peru, Ind.

DETROIT Brass Works, 2000 Brooklyn Ave., Detroit, Mich.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EXETER Brass Works, Exeter, N. H.

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

NATIONAL Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

PRESBREY Co., E. H., 432 Fourth Ave., New York, N. Y. (Distributors.)
(See page 807.)

STANDARD Brass Works, 97-109 Wight St., Detroit, Mich.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

STANDARD PET COCKS

ACORN Brass Mfg. Co., 51 N. Peoria St., Chicago, Ill.

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

AMERICAN Lubricator Co., Summit Ave. & Wabash Ry., Detroit, Mich.

BELFIELD Co., H., 435 N. Broad St., Philadelphia, Pa.

BELKNAP Mfg. Co., Bridgeport, Conn.

BRASS Products Co., 1069 Palmer Ave., E., Detroit, Mich.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CRANE Co., 519 S. Canal St., Chicago, Ill.

CRUM-WILEY Mfg. Co., Peru, Ind.

DETROIT Brass Works, 2000 Brooklyn Ave., Detroit, Mich.

DETROIT Lubricator Co., Detroit, Mich.
(See page 677.)

EAGLE Brass Works, Dubois & Franklin Sts., Detroit, Mich.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EXETER Brass Works, Exeter, N. H.

GREER, Frederic, 525 W. Van Buren St., Chicago, Ill.

HAYDENVILLE Co., Haydenville, Mass.

HOMER Brass Works, 231 Race St., Philadelphia, Pa.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

JARECKI Mfg. Co., Erie, Pa.

KELLY & Jones Co., Greensburg, Pa.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

McNAB & Harlin Mfg. Co., 56 John St., New York, N. Y.

McRAE & Roberts Co., 221-35 Campbell Ave., Detroit, Mich.

MICHIGAN Lubricator Co., 661-73 Beaubien St., Detroit, Mich.

MORGAN Mfg. Co., John St., Newport, R. I.

NATIONAL Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

NOLTE Brass Co., Springfield, O.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

PRESBREY Co., E. H., 432 Fourth Ave., New York, N. Y. (Distributors.)
(See page 807.)

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

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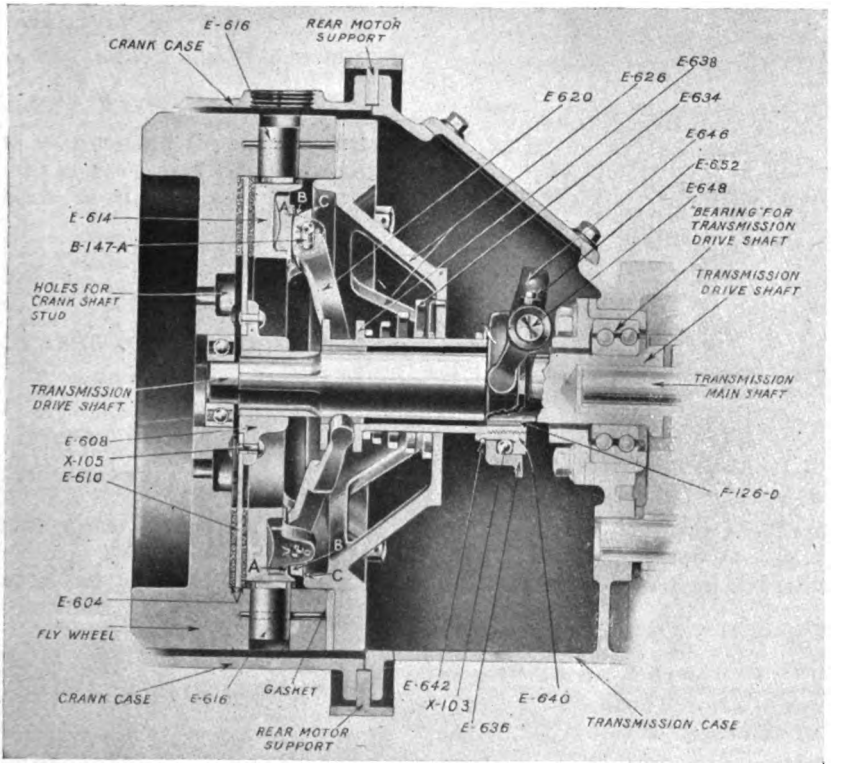
The Universal Clutch

Simple—Elastic—Efficient



SELF ADJUSTING

When properly applied, this Clutch will require no further adjustment.

RUNS IN OIL

Running in oil **reduces wear** to the minimum, makes it **very elastic** and aids in **eliminating** the possibility of **grabbing.**

POSITIVE IN ACTION

Note the mechanical action of this Clutch—The powerful contact through the Clamping Levers (E-620) insures **ample pressure** for frictional engagement, and when releasing, their action assures a **positive release,** eliminating the necessity for **Clutch Brakes** and **kindred appliances.**

For further information address:—

The Auto Engineering Co.

Detroit, Michigan, U. S. A.

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COCKS (Continued)

STANDARD PET COCKS (Continued)

REGESTER'S Sons Co., J., Holliday & Saratoga Sts., Baltimore, Md.

ROBERTS Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

SCHAEFFER & Budenberg Mfg. Co., Brooklyn, N. Y.

SOUTH Park Mfg. Co., Port Huron, Mich.

STANDARD Brass Works, 97-109 Wight St., Detroit, Mich.

STERLING & Skinner Mfg. Co., Russell St. & E. Grand Blvd., Detroit, Mich.

SWIFT Lubricator Co., 729 W. Second St., Elmira, N. Y.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

ORSWELL Igniter Co., 37 Haverhill St., Boston, Mass. "Puritan."

PFANSTIEHL Co., North Chicago, Ill. (See page 833.)

PITTSFIELD Spark Coil Co., Pittsfield, Mass. (See page 169.)

PURITAN—See Orswell Igniter Co.

QUICK ACTION—See Knoblock-Heideman Mfg. Co.

S. M. Novelty Mfg. Co., 52d St. & Baltimore Ave., Philadelphia., Pa. "Ampco."

SCHUG Electric Mfg. Co., 326 Jefferson Ave., Detroit, Mich.

SOLOCOIL—See Lindsley & Allen Electric Co.

SPLITDORF Electrical Co., Newark, N. J.

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WILLIAMS, E Q., 535-39 S. Clinton St., Syracuse, N. Y.

COILS

PIPE COILS

NATIONAL Pipe Bending Co., River & Lloyd Sts., New Haven, Conn.

SPARK COILS

(See also Systems, Single Spark Ignition)

AMERICAN Coil Co., Foxboro, Mass.

AMPCO—See S-M Novelty Mfg. Co.

AUTOCOIL Co., 132 Seventh St., Jersey City, N. J.

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

CONNECTICUT Telephone & Electric Co., Meriden, Conn. (See pages 508 and 509.)

DETROIT Coil Co., 45-49 Fort St., E., Detroit, Mich.

DOW Mfg. Co., 131 Adams St., Braintree, Mass.

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco." (See page 675.)

J & B Mfg. Co., Pittsfield, Mass. (See page 613.)

K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See pages 654 and 655.)

KINGSTON—See Kokomo Electric Co.

KNOBLOCK-HEIDEMAN Mfg. Co., Sample St. & Vistula Ave., South Bend, Ind. "Quick Action."

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

LA FER Instrument Co., 320 Frankfort Ave., Cleveland, O.

LINDSLEY & Allen Electric Co., 257-59 Eddy St., Providence, R. I. "Solocoil."

MENOMINEE Electric Mfg. Co., Menominee, Mich.

NATIONAL Coil Co., Lansing, Mich.

NEW York Coil Co., 344 Pearl St., New York, N. Y. (See page 635.)

COLORS

COACH COLORS

(See Paints and Colors)

COLUMNS

WATER COLUMNS AND BOILER ALARMS

RELIANCE Gauge Column Co., 45 E. Prospect St., Cleveland, O.

COMMUTATORS

ELECTRIC MOTOR COMMUTATORS

CAMERON Electrical Mfg. Co., 205 Main St., Ansonia, Conn.

COLUMBIA Machine Works & Malleable Iron Co., Chestnut St. & Atlantic Ave., Brooklyn, N. Y.

ELECTRIC Materials Co., North East, Pa.

EUREKA Co., North East, Pa. (See page 333.)

HOMER Commutator Co., 4743 Hough Ave., N. E., Cleveland, O.

SPARK COMMUTATORS

(See Timers, Ignition)

COMPOSITION

INSULATING COMPOSITION

(Substitute for Hard Rubber)

BAKELITE—See Boonton Rubber Mfg. Co.

BAKELITE—See Evilo Molding Co.

BAKELITE—See General Bakelite Co.

BAKELITE—See Stevenson Co.

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PITTSFIELD TRADE MARK

"Berkshire One-Piece" Standard Porcelain Plug

80-B ⅞-18 Standard A. L. A. M., single point ..... $.75
81-B ⅞-18 Standard A.L.A.M., double point ..... .75
82-B Metric Thread, single point ..... .75
83-B Metric Thread, double point ..... .75
84-B ½ in. Standard pipe thread, single point ..... .75
85-B ½ in. Standard pipe thread, double point ..... .75

No. 96-B Ford and Reo

½ in. single point .. $.75
Can be supplied with double point when requested.

No. 91-B Buick and Overland

90-B Overland or Buick ⅞ in., single point ..... $.75
91-B Overland or Buick ⅞ in., double point ..... .75
94-B Overland or Buick ½ in., single point ..... .75
95-B Overland or Buick ½ in., double point ..... .75

"JEWELL" Standard Mica Plug

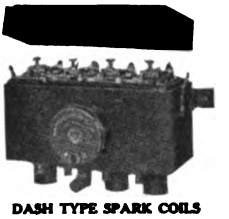
30 ⅞-18 Standard A. L. A. M. plug . $1.00
31 ⅞-18 Standard A. L. A. M. double pt. plug . 1.00
32 Standard metric plug 1.00
33 Standard metric double point plug 1.00
34 ½ in. Standard pipe thread plug . 1.00
35 ½ in. Standard pipe thread double point plug 1.00

"MICATITE" PLUG

38 ⅞-18 Standard . $1.00
44 Metric and Motorcycle 1.00
49 ½ in. pipe thread standard .. 1.00
Furnished with Ball Nut for Franklin Cars
38-F ⅞-18 A. L. A. M. Standard . . $1.10
49-F ½ in. Standard pipe thread special 1.10

PITTSFIELD TIMERS

301 One Cylinder Timer . . $4.50
302 Two Cylinder Timer . 4.80
303 Three Cylinder Timer . 5.10
304 Four Cylinder Timer . 5.40
306 Six Cylinder Timer . . . 5.60



DASH TYPE SPARK COILS

No.	Cyl.	Height	Width	Thickness Inc. Sw.	Price Each
111	1	7⅞ ins.	3¾ ins.	5⅜ ins.	$12.00
112	2	7⅞ ins.	5⅛ ins.	5⅜ ins.	20.00
113	3	7⅞ ins.	8⅛ ins.	5⅜ ins.	30.00
114	4	7⅞ ins.	10 5/16 ins.	5⅜ ins.	35.00
116	6	7⅞ ins.	14 1/16 ins.	5⅜ ins.	50.00

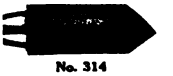
MASTER VIBRATOR

For all cars and especially desirable on Fords of 1915 and 1916 Models.

300 Pittsfield Master Vibrator . . $11.00

MOTORCYCLE CYLINDER COILS

214 1 cylinder 4 lead square end, 2½ ins. diameter, 6½ ins. long $9.76
314 1 cylinder 4 lead conical end, 2½ ins. diameter, 11 ins. long . 9.76
225 2 cylinder 5 lead square end, 2½ ins. diameter, 6 ins. long . . 12.76
325 2 cylinder, 5 lead conical end, 2½ ins. diameter, 9½ ins. long 12.76



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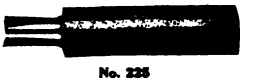

No. 225

KICK-OFF LOCK SWITCH

Simple, Strong, Proof Against Short Circuits

201 Kick-Off Lock Switch B and B $2.26
211 Kick-Off Lock Switch M and B 2.26
212 Kick-Off Lock Switch M only 2.26
219 Kick-Off Lock Switch Key extra ..... .15

BABY PRIMARY SWITCH

202 Baby Primary Switch, open circuit $0.76
203 Baby Primary Switch, closed circuit ..... .76
208 Extra Key ..... .15

In ordering, state whether open or closed circuit switch is wanted.

PITTSFIELD SPARK COIL COMPANY

PITTSFIELD MASSACHUSETTS

Order by Number

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COMPOSITION (Continued)

INSULATING COMPOSITION (Continued)

BAKELITE-DILECTO—See Continental Fibre Co.

BOONTON Rubber Mfg. Co., Boonton, N. J. "Bakelite."

CONDENSITE—See Duranoid Mfg. Co.

CONDENSITE Co. of America, Bloomfield, N. J.

CONTINENTAL Fibre Co., Newark, Del. "Bakelite-Dilecto."
(See page 171.)

CUTLER Hammer Mfg. Co., 12th St. & St. Paul Ave., Milwaukee, Wis. "Thermoplax," "Pyroplax."

DICKINSON Mfg. Co., ft. Mechanic St., Springfield, Mass. "Sternoid," "Stern-Condensite," "Stern-Asbeston."

DURANOID Mfg. Co., 213-19 Chestnut St., Newark, N. J. "Condensite."

ELECTROSE Mfg. Co., 70 Washington St., Brooklyn, N. Y.

EVILO Molding Co., Westfield, N. J. "Bakelite."

GENERAL Bakelite Co., 100 William St., New York, N. Y. "Bakelite."

GENERAL Insulate Co., 1003-14 Atlantic Ave., Brooklyn, N. Y. "Hi-Heet."

GUMMON—See Hemming Mfg. Co.

HEMIT—See Hemming Mfg. Co.

HEMMING Mfg. Co., Garfield, N. J. "Gummon," "Hemit," "Tegit."

HI-HEET—See General Insulate Co.

JOHNS-PRATT Co., 555 Capitol Ave., Hartford, Conn.

LOVERING Co., C. P., (E. Cambridge), Cambridge, Mass.

PYROPLAX—See Cutler Hammer Mfg. Co.

SPECIALTY Mfg. Co., Hoosick Falls, N. Y.

STERN-ASBESTON—See Dickinson Mfg. Co.

STERN-CONDENSITE—See Dickinson Mfg. Co.

STERNOID—See Dickinson Mfg. Co.

STEVENSON Co., 511 Wallace Ave., (Wilkinsburg), Pittsburgh, Pa. "Bakelite."

TEGIT—See Hemming Mfg. Co.

THERMOPLAX—See Cutler Hammer Mfg. Co.

COMPOUNDS

ANTI-FREEZING COMPOUNDS

BLUE Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Premium."

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

IMPERIAL Oil Co., 3124 Locust St., St. Louis, Mo. "Marvin."

JEWEL—See Wadsworth-Howland Co.

LUBRO Oil Co., 116 Prospect Ave., N. W., Cleveland, O.

MARVIN—See Imperial Oil Co.

NORTHWESTERN Chemical Co., Marietta, O. "Thermite."
(See pages 172 and 173.)

PREMIUM—See Blue Ribbon Mfg. Co.

THERMITE—See Northwestern Chemical Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

CARBON REMOVING COMPOUNDS

(See also Removers, Carbon; also Machines, Motor Decarbonizing)

AMERICAN Oil Products Co., 1426 Seneca St., Buffalo, N. Y "Opco."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Destroyo."
(See page 177.)

BLUE Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Premium."

BOYER Chemical Laboratory Co., 11 W. Austin Ave., Chicago, Ill.

BURNOX Co., 6324 Greenfield Ave. (W. Allis), Milwaukee, Wis.

CAR-B-SOL—See Royal Mfg. Co.

CAR-BON-GO—See Van Tilburg Oil Co.

CARBOCIDE—See Van Cleef Bros.

CARBOGAS Co., Gardner Bldg., Toledo, O.

CARBOLIDE Chemical Co., Monrovia, Md.

CARBON Cleaning Compound Co., 901 Euclid Ave., St. Louis, Mo. "Four Sees."

CARBON-NOT Chemical Co., 2 Columbus Circle, New York, N. Y.

CHEMICAL Specialties Co., 1522 Grand Ave., Kansas City, Mo.

COWDIN—See Delphi Auto Specialty Co.

DELPHI Auto Specialty Co., Delphi, Ind. "Cowdin."

DESTROYO—See Atlas Auto Supply Co.

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.

DIAMOND Specialty Co., Indianapolis, Ind.

DULIN Mfg. Co., J. E., 460 S. Grant St., Springfield, Mo. "Dumaco."

DUMACO—See Dulin Mfg. Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

EFFICIENCY Oil Corp., 2100 Kienlan Ave., St. Louis, Mo.

ELGIN Motor Power Mfg. Co., Cedar Rapids, Ia.
(See page 717.)

ENGINETONE—See McCormick Mfg. Co.

FOUR SEES—See Carbon Cleaning Compound Co.

FRANKLIN Distributing Co., 219-21 Mutual Life Bldg., Buffalo, N. Y.

FRENCH Compression Fluide Co., Pasadena, Cal.

GRAHAMOLINE Products Co., Wilkes-Barre, Pa. "Lightning."

HALL-THOMPSON Co., Hartford, Conn. "Magic," "Wonder Worker."
(See page 171.)

HART-BELL—See Utility Products Co.

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Bakelite-Dilocto

Waterproof—Permanent—Strong
A laminated INSULATING material of highest efficiency.

ALSO

Vulcanized Fibre

In Sheets—Rods—Tubes—Special Shapes.

The Continental Fibre Company
NEWARK, DELAWARE

Chicago—McCormick Bldg.
New York—Woolworth Bldg.

This Clutch Will Fit Any Unit Power Plant Transmission

Manufactured by the biggest, exclusive clutch manufacturers in the United States, with facilities for handling every firm's business. The clutch that's—

PATENTED
JUNE 9TH 1914
JUNE 16TH 1914
MAR. 16TH 1915
MAR. 30TH 1915

Built To Do Your Work
The Borg & Beck single-plate dry-disc clutch is making good for leading motor car, truck and tractor manufacturers. It will make good for you.
Protected by patents, it will not "grab," "stutter" or slip. Is foolproof. Has gradual and positive engagement. Eliminates shifting in a crowd. Can be slipped continuously without injury.
Made in any size or special design to fit your requirements. Best for the trade. Write for details.

The Borg & Beck Co.
Moline, Illinois

BORG & BECK MOLINE, ILL.

WONDER WORKER

AUTOMOBILE SPECIALTIES

"The Quality Line"

You will have calls for WONDER-WORKER products—the demand is steadily growing—let us send electros for the best sellers, even if you do not want to show the whole line.

Here Are the Big Sellers

"PARA-PLASTIC"—A high grade pure rubber compound that mends tires and tubes—no heat, acid, tools or vulcanizing necessary.

"QUAD-LAC"—The one preparation for Leather, Mohair or Pantasote trimmings—also for Nickel and Brass.

"RADIATOR CEMENT"—An absolute repair for leaky radiators —without soldering.

"RIM-KOTE"—Prevents tire sticking and rusting to rim—makes tire changing easy.

"DIAMOND VALVE GRINDING COMPOUND"—The ready-to-use grinding paste that gives satisfaction. In 2-ounce and 4-ounce duplex cans.

"AUTO GLOSS"—Made especially for automobile varnish. Cleans any finish w thout injury.

CARRY WONDER-WORKER GOODS THE LINE THAT SATISFIES

Send for Catalog of complete line. New edition with revised trade price list now ready.
Write for copy today.

THE HALL-THOMPSON CO.
HARTFORD, CONN., U. S. A.

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Dealers' Catalog and Price List on the "Chemically Correct" Line

Se-Ment-Ol

Carbonox

Skalex

Graphite Coating

Thermite

Valve Grinding Compound

Kl-Ens-Ol

Pumice Hand Soap

Brass-Kote

Prussian Blue

Spring Leaf Compound

Rim and Gasket Shellac

Clutch and Brake Compound

Special Mohair Top Dressing

SE-MENT-OL, the original self-acting radiator cement. "Finds the leak and fixes it." Retail price per can, 75c. Packed 12 in a case. List price per case, $8.00. Dealers' net price, $4.80 per case.

CARBONOX, the "Chemically Correct" carbon remover. Quart cans only. Retail price, 75c. Packed 12 in a case. List price per case, $8.00. Dealers' net price, $4.80 per case.

SKALEX, radiator cleaner. Retail price per can, 50c. Packed 12 to the case. List price per case, $6.00. Dealers' net price, $3.60 per case.

NORWESCO GRAPHITE COATING. Rust preventive for use on rims and springs. Dries in 3 minutes. Retail price, per half-pint can, 40c. Packed 12 to the case. List price per case, $4.80. Dealers' net price, $2.88 per case.

THERMITE, the "Chemically Correct" anti-freeze. Price per gallon can, $1.25. Packed 6 to the case. List price per case, $7.50. Dealers' net price, $4.50 per case.

VALVE GRINDING COMPOUND, PIONEER Brand, 4 oz. double end box, containing 2 oz. of coarse and 2 oz. of fine. Retail price, per box, 25c. Packed 12 to the case. List price per case, $3.00. Dealers' net price, $1.80 per case. Also sold in various other styles of containers. Write for sizes and prices.

KL-ENS-OL, Liquid Hand Soap. Retail price per can, 35c. Packed 12 to the case. List price per case, $4.20. Dealers' net price, $2.52 per case.

SPRING LEAF COMPOUND, NORWESCO Brand, in tubes, size 1¼" x 5¼". Retail price, 25c. Packed 12 to the case. List price per case, $3.00. Dealers' net price, $1.80 per case.

RIM AND GASKET SHELLAC, PIONEER Brand, 2¼ oz. swab bottles. Retail price, 15c. Packed 12 to the case. List price per case, $1.60. Dealers' net price, 96c. Half pint cans, 25c. List price per case, $3.00. Dealers' net price, $1.80 per case. Pint cans, retail price, 45c. List price per case, $5.40. Dealers' net price, $3.24 per case.

CLUTCH AND BRAKE COMPOUND, PIONEER Brand, in pint cans only. Retail price, 30c. Packed 12 to the case. List price per case, $3.60. Dealers' net price per case, $2.16.

SPECIAL MOHAIR TOP DRESSING, NORWESCO Brand. In quarts and pint cans. Packed 12 to the case. Quart cans, 90c. List price per case, $10.80. Dealers' net price, $7.02 per case. Pint cans, 50c. List price per case, $6.00. Dealers' net price, $3.90 per case.

PRUSSIAN BLUE, NORWESCO Brand. In tubes ¾" x 4". Retail price per tube, 20c. Packed 12 in a display case. List price per case, $2.40. Dealers' net price, $1.56 per case.

BRASS-KOTE. Air-drying enamel. Made in two finishes, Hard Rubber and Gloss Black. Put up in pint and half-pint cans. Packed 12 to the case. Retail price, pint cans, 60c. List price per case, $7.20. Dealers' net price, $4.68 per case. Retail price, half-pint cans, 35c. List price per case, $4.20. Dealers' net price, $2.73 per case.

PUMICE HAND SOAP, NORWESCO Brand. Re-

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Retouching Lacquer

Never-Burn Engine Enamel

Top Dressing

Color Varnishes

tail price per can, 10c. Packed 36 to the case. List price per case, $3.60. Dealers' net price, $2.52 per case.

RETOUCHING LACQUER, NORWESCO Brand. Retail price per half-pint can, 50c. Packed 12 to a case. List price per case, $6.00. Dealers' net price, $3.90 per case.

NEVER-BURN, Engine Enamel. Two finishes, Gloss Black and Battleship Gray. In pints and half-pint cans. Packed 12 to the case. Retail price of pints, 60c. List price per case, $7.20. Dealers' net price, $4.68 per case. Half-pint cans, retail price, 35c. List price per case, $4.20. Dealers' net price, $2.73 per case.

TOP DRESSING, NORWESCO Brand, for leather or pantasote. Put up in quarts and pint cans. Packed 12 to the case. Quart cans, $1.00. List price per case, $12.00. Dealers' net price, $7.80 per case. Pint cans, 60c. List price per case, $7.20. Dealers' net price, $4.68 per case.

COLOR VARNISHES. NORWESCO Brand. For one coat work. Green, Blue, Gray, Red, Tan, Orange, Black and Clear. In quart and pint cans. Packed 12 to the case. Quarts, $1.25. List price per case, $15.00. Dealers' net price, $9.75 per case. Pints, 75c. List price per case, $9.00. Dealers' net price, $5.85 per case. Shipping weight of case, 20 lb. Write for color cards.

UPHOLSTERING DRESSING, NORWESCO Brand. Pint cans only, 50c. Packed 12 to the case. List price per case, $6.00. Dealers' net price, $3.90 per case.

NEVER-RUST, the "Chemically Correct" Rim Paint. In pint cans only, 50c. Packed 12 to the case. List price per case, $6.00. Dealers' net price, $3.90 per case.

LINING DYE, NORWESCO Brand. Pint can only, 40c. Packed 12 to the case. List price per case, $4.80. Dealers' net price $3.12 per case.

TIRE-LAC, the "Chemically Correct" Tire Paint. Three colors, Rubber White, Rubber Gray and Black. In pint cans only. Retail price, 50c. Packed 12 to the case. List price per case, $6.00. Dealers' net price, $3.90 per case.

FIRE-FLY, Dry Powder Fire Extinguisher. Large tube, 2" x 22", 75c. Packed 12 to the case. List price per case, $9.00. Dealers' net price, $4.50 per case. Small tube, 2" x 12", 50c. Packed 12 to the case. List price per case, $6.00. Dealers' net price, $3.00 per case.

ALUMINUM BRONZE, NORWESCO Brand. In half-pint cans. Retail price, 60c. Packed 12 to the case. List price per case, $7.20. Dealers' net price, $4.68 per case.

FORD AND SMALL CAR PAINTING OUTFIT, NORWESCO Brand. Retail price per outfit, $4.00. Outfits come packed six to the case. List price per case, $24.00. Dealers' net price, $15.60 per case.

SIL-VER-OL, Silver plating solution. Half pint cans, 75c. Packed 12 to the case. List price per case, $9.00. Dealers' net price, $5.85 per case.

If you want further information about these or other items of the "Chemically Correct" line, write your nearest jobber or write us.

The

Northwestern Chemical Co.

Marietta, Ohio

Lining Dye

Tire-Lac

Fire-Fly

Aluminum Bronze

Upholstering Dressing

Never-Rust

Sil-Ver-Ol

Ford and Small Car Painting Outfit

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COMPOUNDS (Continued)

CARBON REMOVING COMPOUNDS (Continued)

HARVEY Chemical Co., 216 N. Fifth St., Lafayette, Ind.

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

INDIANAPOLIS Mfg. & Sales Co., 2305 N. Delaware St., Indianapolis, Ind. "Leo."

INDUSTRIAL Technical Products Co., 6243 Broadway, Chicago, Ill.

INTER-TUBE Chemical Co., 1223 Superior St., Cleveland, O.

INTERSTATE Mfg. Co., Wollaston, Mass. "M. H. B."

JEWEL—See Wadsworth-Howland Co.

JIFFY Specialty Co., McKeesport, Pa.

KARBON Klene Co., 227 S. Front St., Philadelphia, Pa.

KARBONOID Chemical Co., 318 East Ave., Elyria, O.

KORINE Carbon Remover Co., 136 Federal St., Boston, Mass.

KREMBS & Co., 173 N. Green St., Chicago, Ill. "Purgcarbon."

LEO—See Indianapolis Mfg. & Sales Co.

LIGHTNING—See Grahamoline Products Co.

M. H. B.—See Interstate Mfg. Co.

McCORMICK Mfg. Co., First & Sears Sts., Dayton, O. "Enginetone."

MAGIC—See Hall-Thompson Co.

MANSFIELD Mfg. Corp., 822-28 S. Clinton St., Syracuse, N. Y.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium."

MITCHELL Mfg. Co., Balboa Bldg., San Francisco, Cal. "Yost."

MOTO Motor Tonic Co., Wichita, Kans.

NONCARBENE Co., 273 Water St., New York, N. Y.

NORTHWESTERN Chemical Co., Marietta, O. "Carbonox."
(See pages 172 and 173.)

OPCO—See American Oil Products Co.

ORIENT Chemical Co., Gumbel Bldg., Kansas City, Mo.

OROLO Mfg. Co., Eighth & Jefferson Sts., Louisville, Ky.

OWL—See Western Chemical Mfg. Co.

POWER-O—See Saries Mfg. Co.

PREMIUM—See Blue Ribbon Mfg. Co.

PREST-O-CARBON—See Prest-O-Lite Co.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. "Prest-O-Carbon."
(See page 553.)

PRICE, Roy D., Waggoner, Ill. "R-D-P."

PURGCARBON—See Krembs & Co.

R-D-P—See Price, Roy D.

RADIUM—See Milwaukee Auto Specialty Co.

RIE-NIE—See Durkee-Atwood Co.

ROYAL Mfg. Co., Hill & Halsey Sts., Newark, N. J. "Car-B-Sol."

SARIES Mfg. Co., 624 N. Union St., Decatur, Ill. "Power-O."

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

THERMAL Efficiency Co., Aldan, Pa. "Thermo."

THERMO—See Thermal Efficiency Co.

THOMAS Carbon Remover Co., 46 Broadway, Providence, R. I.
(See page 179.)

TILCO Co., 814-20 S. Vandeventer Ave., St. Louis, Mo.

UTILITY Products Co., 1475 Broadway, New York, N. Y. "Hart-Bell."
(See page 179.)

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill. "Carbocide."

VAN TILBURG Oil Co., 2424-26 University Ave. S. E., Minneapolis, Minn. "Car-Bon-Go," "Wang."

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WANG—See Van Tilburg Oil Co.

WESTERN Chemical Mfg. Co., 151 Sixth St., Milwaukee, Wis. "Owl."

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

WORKO Co., 1712 Winslow St., Racine, Wis.

YOST—See Mitchell Mfg. Co.

CHEMICAL PLATING COMPOUNDS

(See also Polishes, Metal; also Enamels, Brass)

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Silver Quick."
(See page 177.)

BLUE Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Premium."

DOZIT—See Kirk Mfg. Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

EASTERN Rubber Co., 1529 Ridge Ave., Philadelphia, Pa. "Magic."

FOREST City Sales Co., Fremont, Neb. "Quick Knick."

GUN Metal Finish Co., Main & Water Sts., Decatur, Ill.

JUSTICE Co., A. R., 607 Chestnut St., Philadelphia, Pa. "U-Kan-Plate."

KIRK Mfg. Co., 1522 Grand Ave., Kansas City, Mo. "Dozit."

MAGIC—See Eastern Rubber Co.

NORTHWESTERN Chemical Co., Marietta, O. "Sil-Ver-Ol."
(See pages 172 and 173.)

PILLSBURY Mfg. Co., 322 Hennepin Ave., Minneapolis, Minn. "White Way."
(See page 573.)

PREMIUM—See Blue Ribbon Mfg. Co.

QUICK KNICK—See Forest City Sales Co.

RIE-NIE—See Durkee-Atwood Co.

SIL-VER-OL—See Northwestern Chemical Co.

SILVER QUICK—See Atlas Auto Supply Co.

SLIKUP—See Arnold, N. B.

Complete Index to Classification appears on Pages 8 to 27.

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Eliminating The Drag of Friction

The waste of power eventually causes a more rapid loss than the waste of materials.

Yet power is often allowed to grind itself away unheeded, and involve the steady deterioration of working parts.

The drag of friction must be lightened before power leaks are stopped. Point contact on the bearing parts, gained through the use of ball bearings, is the only thorough remedy.

U. S. Ball Bearings are constructed to guard most efficiently both the generated power and the bearing parts of any mechanism. Because of this perfection the delivery of each motor impulse is subjected to the least hindrance.

Critically tested in the most arduous trials of endurance and speed, U. S. Ball Bearings have demonstrated their worth repeatedly. They have earned the endorsement of actual use now given them by experts in the elimination of friction.

U. S. Ball Bearings are made in types to meet every possible radial, thrust and combined load. Let us send you detailed information.

U. S. BALL BEARING MFG. COMPANY

(Conrad Patent Licensee)

Palmer St. and Kolmar Ave., CHICAGO

US

TRADE MARK

U. S. MADE FOR U. S. TRADE

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COMPOUNDS (Continued)

CHEMICAL PLATING COMPOUNDS (Continued)

U-KAN-PLATE—See Justice Co.

VAN TILBURG Oil Co., 2424-28 University Ave. S. E., Minneapolis, Minn. "Wang."

WANG—See Van Tilburg Oil Co.

WHITE WAY—See Pillsbury Mfg. Co.

GLASS WIND SHIELD COMPOUNDS

(For keeping glass clear in rain or fog; For Mechanical Cleaners—See Cleaners, Glass Wind Shield)

ALDER Chemical Co., **Mt. Vernon, N. Y.** "Star."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "See Kleer." (See page 177.)

BEATSEMALL—See Thomae Co.

BLUE Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Premium."

C-CLEER—See Sole Mfg. Co.

CENTRAL Agency Co., Rialto Bldg., Kansas City, Mo. (See page 865.)

CHEMICAL Spray Co., 74 Pearl St., Boston, Mass.

CRISTALENE—See Mahlmann, Altona & Co.

EMERALD—See Thurston Specialty Co.

FORBES Co., Benjamin P., 409 Superior Ave., N. W., Cleveland, O. "Glasbrite."

GLASBRITE—See Forbes Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

MAHLMANN, Altona & So., 601-05 E. Court Ave., Des Moines, Ia. "Cristalene."

PREMIUM—See Blue Ribbon Mfg. Co.

SEE-KLEER—See Atlas Auto Supply Co.

SHED-WATER—See Tilco Co.

SOLE Mfg. Co., 258 Broadway, New York, N. Y. "C-Cleer."

STAR—See Alder Chemical Co.

THOMAE Co., C. O., Times Bldg., New York, N. Y. "Beatsemall."

THURSTON Specialty Co., New Haven, Conn. "Emerald."

TILCO Co., 814 20 S. Vandeventer Ave., St. Louis, Mo. "Shed-Water."

VAN TILBURG Oil Co., 2424-28 University Ave. S. E., Minneapolis, Minn. "Wang."

WANG—See Van Tilburg Oil Co.

WONDER WORKER—See Hall-Thompson Co.

PUNCTURE SEALING COMPOUNDS

A. B. C.—See Pneumatic Tire Fluid Co.

AIR-IN-AL—See Woodbridge Chemical Co.

AIRTITE Co., 22 Motor Mart, Boston, Mass.

ALCEMO Mfg. Co., 5 Bridge St., Newark, N. J. "Kor-Ker."

ALODIUM—See Lydon Mfg. Co.

BAER Mfg. Co., North American Bldg., Philadelphia, Pa. "Tireen."

BALES Puncture Plugger Co., Wimmer Bldg., Indianapolis, Ind.

BLAU, Jacob B., 622 N. Connecticut Ave., Atlantic City, N. J.

DAN-MAR Corp., 1790 Broadway, New York, N. Y. (Distributors.) (See page 177.)

DANBURY Chemical Co., 59 Maple Ave., Danbury, Conn.

DENVER Ford Starter Co., 327 Century Bldg., Denver, Colo. "Kimbroughs." (See pages 647 and 651.)

DRY Co., Harry S., 170 W. Oley St., Reading, Pa.

FIBER Mfg. Co., 1649 Court Pl., Denver, Colo. "Joy-Ride."

INTERSTATE Puncture Proof Co., 1331 Curtis St., Denver, Colo.

JIFFY Specialty Co., McKeesport, Pa.

JOVO—See Vogel Co.

JOY-RIDE—See Fiber Mfg. Co.

KIMBROUGHS—See Denver Ford Starter Co.

KOR-KER—See Alcemo Mfg. Co.

L-TY-TO—See Schofield Laboratories Co.

LYDON Mfg. Co., 116 S. Michigan Ave., Chicago, Ill. "Alodium."

OROLO Mfg. Co., Eighth & Jefferson Sts., Louisville, Ky.

PNEUMATIC Tire Fluid Co., 1732-50 Wazee St., Denver, Colo. "A. B. C."

PUNCTUREMEND Co., 1220 W. Sixth St., Cleveland, O.

SCHOFIELD Laboratories Co., Kansas City, Mo. "L-Ty-To." (See page 177.)

SEALO Tire Co., 14 E. Jackson Blvd., Chicago, Ill.

TIREEN—See Baer Mfg. Co.

TYRE Seal Co., 1237-49 N. Howard St., Philadelphia, Pa.

VOGEL Co., Joseph A., 1203 Lombard St., Wilmington, Del. "Jovo."

WOODBRIDGE Chemical Co., 451 W. 19th St., New York, N. Y. "Air-In-Al." (See page 177.)

RADIATOR CLEANING COMPOUNDS

AMERICAN Oil Products Co., 1426 Seneca St., Buffalo, N. Y. "Opco."

BANNER—See Cortland Specialty Co.

COROL Co., Fisher Bldg., Chicago, Ill.

CORTLAND Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Banner."

DECALCIFIER—See Milwaukee Auto Specialty Co.

FIELD Auto Compound Mfg. Co., Auburn, Me.

FLUFF-FOE—See Garratt-Callahan Co.

GARRATT-CALLAHAN Co., 37 S. Clinton St., Chicago, Ill. "Fluff-Foe."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Decalcifier."

NATIONAL Metal Radio Compound Co., Fort Dodge, Ia. "Radio." (See page 177.)

Complete Index to Classification appears on Pages 8 to 27.

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RADIO

STOP LEAK—Will positively stop leaks in radiators in five minutes. Harmless to radiators, hose connections and pipe joints. Price, 50 cents per can; $3.00 per dozen.

STOP STEAMING—Will clean out foreign substances and scale and restore original circulation space to radiator and water jackets. Guaranteed positively harmless. Price, $1.00 per quart; $6.00 per dozen.

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Send for Jobbers' Prices.

NATIONAL METAL RADIO COMPOUND COMPANY

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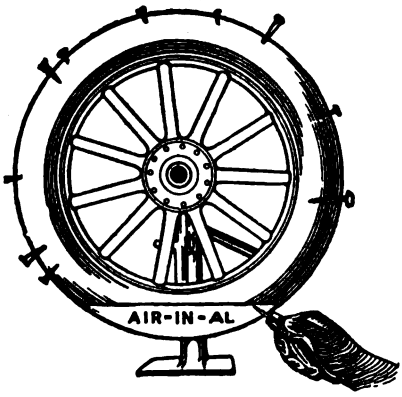

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Tire-Doh, cement, alone, 4 oz. can	.25

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COMPOUNDS (Continued)

RADIATOR CLEANING COMPOUNDS (Continued)

NIP RUST—See Reflex Ignition Co.

OPCO—See American Oil Products Co.

RADIATOL—See Wills Chemical Co.

RADIO—See National Metal Radio Compound Co.

REFLEX Ignition Co., 1710 Payne Ave., Cleveland, O. "Nip Rust."
(See page 675.)

SUTHERLAND & Co., P., 232 Milk St., Boston, Mass. "Velvet."

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VELVET—See Sutherland & Co.

WILLS Chemical Co., Board of Trade Bldg., Wheeling, W. Va. "Radiatol."

WONDER WORKER—See Hall-Thompson Co.

YOUNG & McBride, Catasauqua, Pa.

RUST PREVENTING AND REMOVING COMPOUNDS

RUSTICENE Sales Co., 389 Orange St., New Haven, Conn.
(See page 527.)

TIRE FILLING COMPOUNDS

BETTERN-AIR Co., 1306-08 Callowhill St., Philadelphia, Pa.

BOSKA Mfg. Co., Highland, N. Y.

CARTER-BELL Mfg. Co., Morris Ave., Millburn, N. J.

CLARKS Resilient Tire Filler Co., Thomasville, Ga.

DAHL Punctureless Tire Co., 15th St. & Hennepin Ave., Minneapolis, Minn.

EFFICIENCY Oil Corp., 2100 Kienlan Ave., St. Louis, Mo.

ESSENKAY Products Co., 543 Orleans St., Chicago, Ill.

GRAINGER & Co., 119 N. Tenth St., Louisville, Ky.

NATIONAL Rubber Filler Co., Midlothian, Texas.

NATIONAL Tire Filler Co., 1415 Scribner Ave., Grand Rapids, Mich.

NEWMASTIC Co., 151 W. 68th St., New York, N. Y.

NORTHWESTERN Chemical Co., Marietta, O. "Skalex."
(See pages 172 and 173.)

PANAMA Rubber & Equipment Co., 1423 Locust St., St. Louis, Mo.

SKALEX—See Northwestern Chemical Co.

TIREOID Co., 1200 S. Michigan Ave., Chicago, Ill.

TIRE PRESERVING COMPOUNDS

BIGGER Rubber Preservative Co., 567 Washington St., Buffalo, N. Y.

TIRE REPAIR COMPOUNDS

(For filling cuts in outer casings)

ALLIANCE Rubber Co., Alliance, O.
(See page 845.)

AMERICAN Rubber & Tire Co., 70-78 Beach St., Akron, O. "Stickfast."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Tire-Doh."
(See page 177.)

BESTYET—See St. Louis Rubber Cement Co.

C. O. T. GUM GUM—See Tingley & Co.

COX, David H., Chestnut St., Roselle, N. J.

CUT WELD—See Keystone Rubber Mfg. Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

EASTERN Rubber Co., 1529 Ridge Ave., Philadelphia, Pa. "Magic."

ECLIPSE Cement & Blacking Co., 1238 Belmont Ave., Philadelphia, Pa.

EMPIRE Rubber & Tire Co., Mulberry St., & Clinton Ave., Trenton, N. J.

EUREKA Cement Co., 2-6 Ave. A, Newark, N. J.

FIRESTONE Tire & Rubber Co., Akron, O.

FIXIT—See Gorman Co.

GOODRICH Co., B. F., Akron, O.

GORMAN Co., J. P., 47 W. 42d St., New York, N. Y. "Fixit."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HAZEN-BROWN Co., 430 Court St., Brockton, Mass. "Nu-Tread."

HOLD-TITE—See Portage Rubber Co.

JIFFY—See Johnstown Rubber Co.

JOHNSTOWN Rubber Co., Johnstown, Pa. "Jiffy."

K & W Rubber Co., Orange St., Ashland, O.

KEYSTONE Rubber Mfg. Co., Erie, Pa. "Cut Weld."
(See page 521.)

KNEAD-IT—See M. & M. Mfg. Co.

KUSHION-KORE—See American Kushion-Kore Tire Co.

KUTFILLER—See Self-Vulcanizing Rubber Works.

LEE Tire & Rubber Co., Conshohocken, Pa. "Sure-Lee Fixit."

M. & M. Mfg. Co., Miami St., Akron, O. "Knead-it."

MAGIC—See Eastern Rubber Co.

MASTIC—See Michelin Tire Co.

MATTSON Rubber Co., Lodi, N. J.
(See page 827.)

MICHELIN Tire Co., Milltown, N. J. "Mastic."
(See Inside Back Cover.)

MILLER Rubber Co., Akron, O.

MOLD-IT—See Van Cleef Bros.

MOTOR Car Supply Co. of Minneapolis, 1311 Nicollet Ave., Minneapolis, Minn.

MOTOR Supplies Mfg. Co., 21 Fifth St., N. E., Minneapolis, Minn. "Perma-Tite."

NARCO—See National Rubber Co.

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NATIONAL Rubber Co., 4409 Papin St., St. Louis, Mo. "Narco."

NEWTRED—See Self-Vulcanizing Rubber Works.

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SLIKUP CLEAR LACQUER	PREVENTS TARNISH
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SLIKUP SILVER FINISH	SILVER PLATES BRASS & COPPER
SLIKUP ENAMEL TOP DRESSING	WATERPROOFS
SLIKUP MOHAIR TOP CLEANER	CLEANS TOPS AND COVERS
SLIKUP TOP LINING DYE	REFINISHES
SLIKUP LEATHER-KOTE	RENEWS OLD LEATHER
SLIKUP RIM PAINT	PREVENTS RUST
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SLIKUP AUTO VARNISH	TRANSPARENT & COLORS

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COMPOUNDS (Continued)

TIRE REPAIR COMPOUNDS (Continued)

NU-TREAD—See Hazen-Brown Co.

PERMA-TITE—See Motor Supplies Mfg. Co.

PORTAGE Rubber Co., Barberton, O. "Hold-Tite."

QUAKER City Rubber Co., Philadelphia, Pa. "Quakerdo."
(See page 839.)

QUAKERDO—See Quaker City Rubber Co.

RIE-NIE—See Durkee-Attwood Co.

S-V—See Williams Mfg. Co.

ST. LOUIS Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "Bestyet."

SANBLIST—See Self-Vulcanizing Rubber Works.

SELF-VULCANIZING Rubber Works, Morristown, N. J. "Kutfiller," "Sanblist," "Newtred."

SIMPLEX Auto Specialty Co., 738 Woodward Ave., Detroit, Mich.

STICKFAST—See American Rubber & Tire Co.

SURE-LEE FIXIT—See Lee Tire & Rubber Co.

TINGLEY & Co., C. O., Rahway, N. J. "C. O. T. Gum Gum."

TIRE-DOH—See Atlas Auto Supply Co.

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill. "Mold-it."

VULTITE Rubber Co., Bridgeport, Conn.
(See page 797.)

WILLIAMS Mfg. Co., 18th & Carman Sts., Camden, N. J. "S-V."

WONDER WORKER—See Hall-Thompson Co.

VALVE GRINDING COMPOUNDS

ACME—See Jones Ball Co.

AUTO Equipment Co., 32 Hollywood Ave., East Orange, N. J. "Eureka."

BIG 4—See Gray Specialty Co.

BRIDGEPORT Wood Finishing Co., New Milford, Conn. "Lithowite."

CARBORUNDUM Co., Buffalo & 18th Sts., Niagara Falls, N. Y.

CLOVER Mfg. Co., Norwalk, Conn.

DIAMOND—See Hall-Thompson Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

E. Z.—See International Mfg. & Sales Co.

EUREKA—See Auto Equipment Co.

GRAY Specialty Co., 148 Avon Ave., Newark, N. J. "Big 4."

GRYNDYN—See Stewart & Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker," "Quick-Kut," "Diamond."
(See page 171.)

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

HUSTLER—See Low & Co.

IDEAL Valve Grinder Co., 1478 W. 22d St., Los Angeles, Cal. "O. K."

INTERNATIONAL Mfg. & Sales Co., 6304 Wallace St., Chicago, Ill. "E. Z.," "Peerless," "X. L."

JIFFY Specialty Co., McKeesport, Pa.

JONES Ball Co., Arlington Heights, Mass. "Acme."

LIGHTNING Mfg. Co., Cornish Flat, N. H.

LITHOWHITE—See Bridgeport Wood Finishing Co.

LOW & Co., S. C., 25 St. Nicholas Terrace, New York, N. Y. "Hustler."

MOHAWK Grinding Paste Mfg. Co., Albany, N. Y.
(See page 211.)

NATIONAL Valgrinok Co., 195 Church St., Newton, Mass. "Valgrinok."

NORTHWESTERN Chemical Co., Marietta, O. "Pioneer."
(See pages 172 and 173.)

NORTON Co., Worcester, Mass.

O. K.—See Ideal Valve Grinder Co.

PEERLESS—See International Mfg. & Sales Co.

PIONEER—See Northwestern Chemical Co.

QUICK-KUT—See Hall-Thompson Co.

RAPIDCUT—See S. B. R. Specialty Co.

RIE-NIE—See Durkee-Atwood Co.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Rapidcut."

SMITH Machine Works, Winton L., Newark, N. J.

SMOOTH-CUT Powder Co., Flint, Mich.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STEWART & Co., 171 Broadway, New York, N. Y. "Gryndyn."

VALGRINOK—See National Valgrinok Co.

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

WANG—See Van Tilburg Oil Co.

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

X. L.—See International Mfg. & Sales Co.

CONDUIT

FLEXIBLE CAR WIRING CONDUIT

ALPHADUCT Co., 136 Cator Ave., Jersey City, N. J.

AUTOFLEX—See National Metal Molding Co.

BRASSFLAX—See National Metal Molding Co.

DURADUCT—See Tubular Woven Fabric Co.

FLEXTUBE—See National Metal Molding Co.

NATIONAL Metal Molding Co., Fulton Bldg., Pittsburg, Pa. "Autoflex," "Flextube," "Steelflex," "Brassflex."

SAFETY-ARMORITE Conduit Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

STEELFLEX—See National Metal Molding Co.

TUBULAR Woven Fabric Co., Pawtucket, R. I. "Duraduct."

CONES

BALL CONES

(See Cups, Ball)

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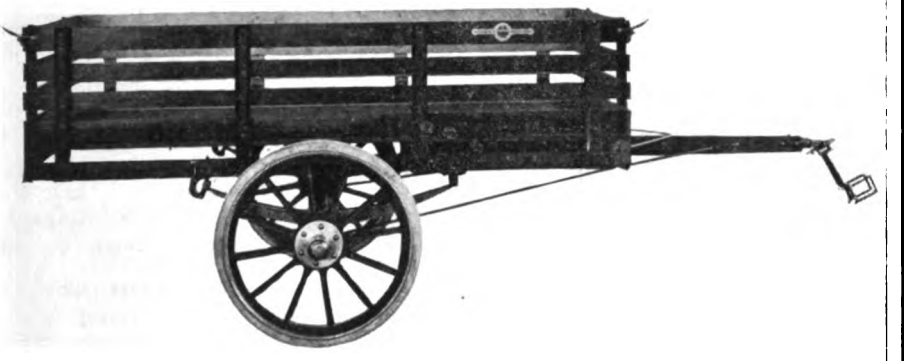

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CONNECTIONS

AIR SYSTEM TIRE CONNECTIONS

HANSEN Mfg. Co., Illuminating Bldg., Cleveland, O.

ROMORT Mfg. Co., 1810 Westlake Ave., Seattle, Wash.
(See page 450.)

BRASS WATER CONNECTIONS

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

AMERICAN Tube Products Co., Euclid Ave. E. & Grand Trunk Ry., Detroit, Mich.

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago. Ill.
(See page 869.)

STANDARD Metalwork Co., 22-40 Prospect St., Thompsonville, Conn.

STANDARD Tool & Mfg. Co., 68-72 E. Lafayette Ave., Detroit, Mich.

WELCH Bros., Pontiac, Mich.

WHITLOCK Coil Pipe Co., Hartford, Conn.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WILKINSON Co., Wm. H., West Medway, Mass.

GAS TUBING CONNECTIONS

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

MORGAN Mfg. Co., John St., Newport, R. I.

UNIFORM Seamless Wire Co., 71 Peck St., Providence, R. I.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

STEERING CONNECTIONS

BILLINGS & Spencer Co., Hartford, Conn.

CINCINNATI Ball Crank Co., Cincinnati, O.
(See page 183.)

MICHIGAN Electric Welding Co., Detroit, Mich.
(See page 297.)

S & W—See Schweppe & Wilt Mfg. Co.

SCHWEPPE & Wilt Mfg. Co., Detroit, Mich. "S & W."
(See page 415.)

TIRE PUMP CONNECTIONS

ACORN—See Stevens & Co.

ADJUSTABLE Lighter Co., 18 Pearl St., Newton, Mass. "Larkin."

AUSTIN & Co., H. K., 28 Lincoln St., Reading, Mass.

BELL Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.

BOSS—See Stevens & Co.

BOSTON—See Boston Starter & Specialty Co.

BOSTON Starter & Specialty Co., 188 Columbus Ave., Boston, Mass. "Boston."

BULL DOG—See Stevens & Co.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

ECLAIR—See Stevens & Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EVERTIGHT—See Smith Bros. Garage.

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y.

GLOBE Mfg. Co., Battle Creek, Mich.

GRAB—See Motor Car Equipment Co.

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

GURNARD Mfg. Co., 12 Cabot St., Beverly, Mass. "Thumlock."

HANSEN Mfg. Co., Illuminating Bldg., Cleveland, O.

IDEAL—See Stevens & Co.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y.
(See pages 415 and 799.)

KENO—See Stevens & Co.

KING, L. Gerald, 21 Pine St., Deposit, N. Y.

LARKIN—See Adjustable Lighter Co.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill.
(See page 735.)

MOTOR Car Equipment Co., 21 W. 62d St., New York, N. Y. "Grab."
(See page 809.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NOERA Mfg. Co., 21-97 Griggs St., Waterbury, Conn.

OSBORNE & Stephenson Mfg. Co., Plainville, Conn.
(See page 709.)

PERFECT—See Youse Co.

PERFECTION—See Smith Auto Co.

PERFECTION—See Stevens & Co.

ROMORT Mfg. Co., 1810 Westlake Ave., Seattle, Wash.
(See page 450.)

SCHRADER'S Son, A., 782-91 Atlantic Ave., Brooklyn, N. Y.
(See page 255.)

SMITH Auto Co., Clyde H., Skowhegan, Me. "Perfection."

SMITH Bros. Garage, 467-69 Main St., Melrose, Mass. "Evertight."

STEVENS & Co., 375 Broadway, New York, N. Y. "Keno." "Swivel K." "Perfection." "Boss." "Bull Dog." "Acorn." "Eclair." "Ideal."
(See page 813.)

SUNDERLAND Mfg. Co., 61 E. 24th St., Chicago, Ill.

SWIVEL K—See Stevens & Co.

THUMLOCK—See Gurnard Mfg. Co.

YOUSE Co., E. S., 46 N. Fifth St., Reading Pa. "Perfect."

Complete Index to Classification appears on Pages 8 to 27.

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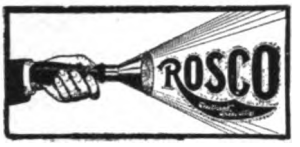
High Grade Electrical Specialties



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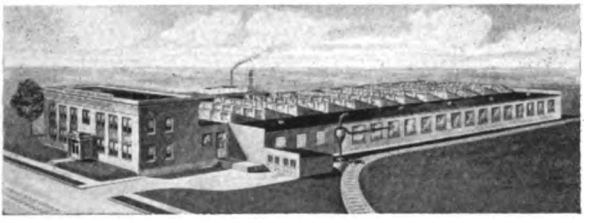

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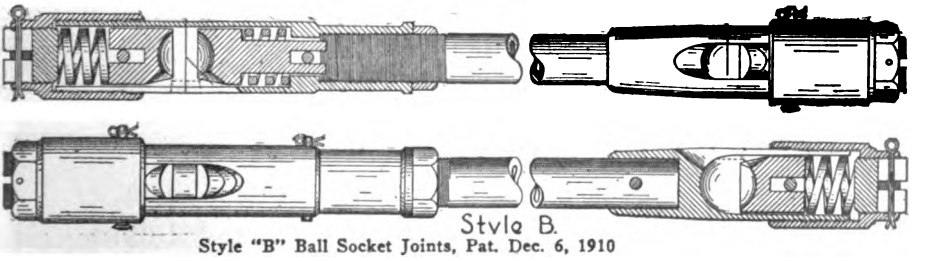

Style "B" Ball Socket Joints, Pat. Dec. 6, 1910

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CONNECTORS

ACETYLENE LAMP CONNECTORS

(For Rubber Connectors—See Tubing, Soft Rubber)

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

PENNFLEX—See Pennsylvania Flexible Metallic Tubing Co.

PENNSYLVANIA Flexible Metallic Tubing Co., Broad & Race Sts., Philadelphia, Pa.

BATTERY CONNECTORS

(See also Terminals, Wire)

AMERICAN Ever Ready Works, Long Island City, N. Y. "Bull Dog."

BAILEY Co., Wm. J., 401-07 Mulberry St., Newark, N. J. "C. B."

BARCY-NICHOLSON Co., 841-43 Fort St., W., Detroit, Mich.

BECCO—See Michigan Motor Specialties Co.

BLISS-CHESTER Co., Providence, R. I. (See page 517.)

BREAZNELL, J. H., 26 Court St., Brooklyn, N. Y.

BULL DOG—See American Ever Ready Works.

C. B.—See Bailey Co.

CHICAGO Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

E. G.—See Grossman Mfg. Co.

FAHNESTOCK Electric Co., 129 Patchen Ave., Brooklyn, N. Y.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Perfection," "Standard." (See page 685.)

FRANCO—See Interstate Electric Novelty Co.

GOODSON—See Graham Mfg. Co.

GRAHAM Mfg. Co., 94 Point St., Providence, R. I. "Goodson."

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G.," "Holdfast." (See page 829.)

HANDY—See Chicago Electric Mfg. Co.

HARVARD Electric Co., 525 W. Van Buren St., Chicago, Ill.

HERZ & Co., 245 W. 55th St., New York, N. Y. (See page 389.)

HI-PO Waterproof Battery Co., 1007 Atlantic Ave., Brooklyn, N. Y.

HOLDFAST—See Grossman Mfg. Co.

INTERSTATE Electric Novelty Co., 104 S. Fourth St., Brooklyn, N. Y. "Franco."

KNOBLOCK-HEIDEMAN Mfg. Co., Sample St. & Vistula Ave., South Bend, Ind. "Quick Action."

LOMBARDI Motor Car Co., 67-71 Minerva St., Derby, Conn.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco." (See page 671.)

NATIONAL Carbon Co., Cleveland, O.

PERFECTION—See Fitzgerald Mfg. Co.

PERFECTO—See Simplex Auto Specialty Co.

QUICK ACTION — See Knobloch-Heideman Mfg. Co.

SHAIN, Chas. D., Brooklyn, N. Y.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich. "Perfecto."

STANDARD—See Fitzgerald Mfg. Co.

ELECTRIC LAMP CONNECTORS

AID Mfg. Co., 2625 Stewart Ave., Chicago, Ill.

ANCHOR—See Metal Specialties Mfg. Co.

CHICAGO Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

CULVER-STEARNS Mfg. Co., Detroit, Mich. (See page 699.)

FRANCO—See Interstate Electric Novelty Co.

GIBSON-HOLLISTER Mfg. Co., 3380 Washington St., Boston, Mass. (See pages 391 and 392.)

HANDY—See Chicago Electric Mfg. Co.

INTERSTATE Electric Novelty Co., 104 S. Fourth St., Brooklyn, N. Y. "Franco."

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Anchor." (See page 257.)

MORSE, Frank W., 293 Congress St., Boston, Mass. (See page 517.)

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco." (See page 183.)

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

CONTROLLERS

ACETYLENE LAMP CONTROLLERS

(See also Regulators, Acetylene Pressure.)

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

ELECTRIC MOTOR CONTROLLERS

(For varying speed of electric vehicles)

BRIGGS & Stratton Co., 253 Milwaukee St., Milwaukee, Wis.

CUTLER Hammer Mfg. Co., 12th St. & St. Paul Ave., Milwaukee, Wis.

GENERAL Electric Co., Schenectady, N. Y.

INDUSTRIAL Controller Co., 886 Greenbush St., Milwaukee, Wis.

WESTERN Electric Co., 463 West St., New York, N. Y. (See page 517.)

COOLERS

WATER COOLERS

(See Radiators, Water Cooling)

Complete Index to Classification appears on Pages 8 to 27.

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Uniformity

In the rapid development of the automobile industry the marked tendency toward standardization has been an important element. In this movement the Continental Motor has been a leader—has, in fact, won the title of America's **standard** motor.

Such a proud title could not long be maintained without uniformity of product. Continental design changes only in the direction of simplification and standardization. Continental workmanship does not vary except to increase in accuracy. Continental inspection becomes only more zealous.

The result is the Continental Motor in its various models, dependably uniform—the choice of more than 150 manufacturers of pleasure cars and trucks and of over 200,000 owners.

Continental Motors Company

Detroit, Michigan

FACTORIES: DETROIT—MUSKEGON

Largest exclusive motor manufacturers in the world

Continental Motors

CONTINENTAL MOTORS · AMERICA'S STANDARD · Power that Leads the Nation

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COPPER

SHEET AND ROD COPPER

(See Brass, Sheet)

TUBE COPPER

(See Tubing, Brass)

CORDS

SEAMING CORDS

MEYER & Co., John C., Lowell, Mass.

CORK

BRAKE AND CLUTCH INSERTS

ARMSTRONG Cork Co., 124 23d St., Pittsburg, Pa. (See page 187.)

CORK Insert Co., 164 Federal St., Boston, Mass.

DIAMOND Cork Co., 59 Pearl St., New York, N. Y.

MUNDET & Son, L., King, Ferris & Sullivan Sts., Brooklyn, N. Y.

PADDOCK Cork Co., 1209-17 De Kalb Ave., Brooklyn, N. Y.

SPANISH-AMERICAN Cork Co., 2211 Pennsylvania Ave., Baltimore, Md.

COUNTER-SHAFTS

FINISHED COUNTER-SHAFTS

BALL—See New York Gear Works.

DETROIT Standard Gear Co., 742 Woodbridge St., E., Detroit, Mich.

DURSTON Gear Co., Syracuse, N. Y.

LIGGETT Spring & Axle Co., Monongahela, Pa.

NEW YORK Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y. "Ball." (See page 807.)

RUSSEL Motor Axle Co., North Detroit, Mich. (See page 778.)

TIMKEN-DETROIT Axle Co., Detroit, Mich.

COUPLERS

TRAILER COUPLERS

FERNALD Mfg. Co., North East, Pa. (See page 863.)

COUPLINGS

HOSE COUPLINGS

(See Clamps, Hose)

MAGNETO COUPLINGS

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

CLARK Flexible Coupling Co., 27 Walker St., New York, N. Y. (See page 187.)

CLIMAX—See Sterling Metal Parts Co.

EISEMANN Magneto Co., 32-33d St., Brooklyn, N. Y. (See page 327.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

SMITH-SERRELL Co., 90 West St., New York, N. Y.

STERLING Metal Parts Co., Eighth St. & Oklahoma Ave., Milwaukee, Wis. "Climax."

SWISS Magneto Co., 208 S. La Salle St., Chicago, Ill.

WERNER Coupling Co., 931 Dauphin St., Philadelphia, Pa.

PIPE COUPLINGS

(See Fittings, Pipe)

TUBE COUPLINGS

(See Unions, Tubing)

COVERS

AUTOMOBILE COVERS

(For covering automobiles when in the garage)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. (See page 793.)

DAFOE-EUSTICE Co., Jefferson Ave. & Antoine St., Detroit, Mich. "Duk-Bak."

DUK-BAK—See Dafoe-Eustice Co.

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

FULTON Bag & Cotton Mills, Atlanta, Ga. "Shuredry."

GREATER N. Y. Auto Cover Co., 2733 Third Ave., New York, N. Y.

HANISCH Sons, R., 121-23 N. Halsted St., Chicago, Ill.

HUMPHREYS Sons, R. A., 1021-23 Callowhill St., Philadelphia, Pa.

JACKSON Cover & Bag Co., Jackson, Mich.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

McAVOY Co., M. I., 1220 Washington St., Racine, Wis. (See page 855.)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

REACH Textile Co., A. L., 133 Pearl St., Boston, Mass.

ROYAL Textile Co., 200 Congress St., Boston, Mass.

SCHOTT Bros. Co., Buckeye & Main Sts., West Salem, O.

SHUREDRY—See Fulton Bag & Cotton Mills.

WARDEN Co., Geo. J., 6530-34 Carnegie Ave., Cleveland, O.

WILEY & Son Co., Wm. H., 80 Pliny St., Hartford, Conn.

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Detroit Axle Co.

DETROIT, MICH.

MANUFACTURERS OF

FRONT and REAR

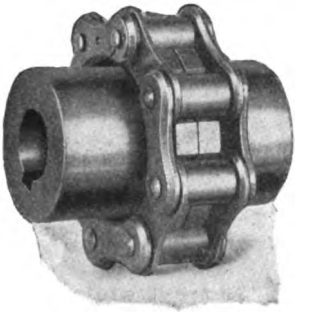
AXLES

FOR

LIGHT CARS

Write Us for Blue Prints

CLARK Flexible COUPLING



The latest and best device for eliminating undue strain and friction in transmission of power.
Adapted to the following uses: MAGNETOS, AUTOMOBILES, MOTOR TRUCKS, MOTOR BOATS, PROPELLER SHAFTS, STEAM and GAS ENGINES and AIR COMPRESSORS, PUMPS vertical and horizontal, BLOWERS and FANS.
We fully guarantee couplings that we recommend.
We respectfully solicit inquiries from the Trade.

CLARK FLEXIBLE COUPLING CO., Inc.
27 Walker Street NEW YORK
DARLING BROS., Ltd. Montreal, Que., Canada.
PACIFIC NET & TWINE CO. Seattle, Wash., U. S. A.

Meeting Competition

The prospective car owner of today is a discriminating buyer, due to thousands of dollars worth of educational advertising. Before purchasing, he intelligently compares your car, point for point, with your competitors'. Other things being equal, even such a small thing as guaranteeing it permanently against oil leakage and rattle may swing his preference.

ACCO CORK COMPOSITION GASKETS AND WASHERS

make this possible This material does more than simply retard leakage. It prevents it because the pure, ground cork from which it is made is impervious to oil, grease, gasoline and water. Seepage is impossible. Moreover, the natural and permanent elasticity of Acco Cork keeps joints tight indefinitely. Besides, it prevents rattling due to loose bolts and makes the careful machining of contact surfaces unnecessary.
Further information regarding Acco Gaskets and Washers, and other cork parts for motor cars, will be sent, free of charge, on request.

Ⓐ Ⓐ

ARMSTRONG CORK COMPANY
124 Twenty-third Street Pittsburgh, Pa.

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COVERS (Continued)

CORK PULLEY RIM COVERS

ARMSTRONG Cork Co., 124 23d St., Pittsburg, Pa.
(See page 187.)

LAMP COVERS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

ECONOMY Stay Co., Jefferson City, Mo.

GIFFORD & Son, John A., 25 Park Pl., New York, N. Y. "Tompkins."

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

LANDERS Bros. Co., Dept. A2, Toledo, O.
(See page 351.)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PREMIER Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

TOMPKINS—See Gifford & Son.

WILEY & Son Co., Wm. H., 30 Pliny St., Hartford, Conn.

LEATHER MAGNETO COVERS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BAILEY Co., R. B., 406 W. Pico St., Los Angeles, Cal.

BANTLIN Co., Julius J., 216 E. Third St., Cincinnati, O.
(See page 583.)

BAUER-LEWIS Co., 363 Holden Ave., Detroit, Mich.

CAMPBELL—See Perkins Campbell Co.

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

DAFOE-EUSTICE Co., Jefferson Ave. & Antoine St., Detroit, Mich. "Duk-Bak."

DUK-BAK—See Dafoe-Eustice Co.

ECONOMY Stay Co., Jefferson City, Mo.

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

GOSS Co., J. C., 16 Woodbridge St., E., Detroit, Mich.

HAGER & Son, Chas., 1876 Broadway, New York, N. Y.

HOOVER Co., W. H., New Berlin, O.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

REINHOLD Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

SMITH & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

STEVENS & Bro., A. A., 1224 Wabash Ave., Chicago, Ill.

WILEY & Son Co., Wm. H., 30 Pliny St., Hartford, Conn.

OIL HOLE COVERS

AMERICAN Pin Co. (Waterville Station), Waterbury, Conn.

BAY State Stamping Co., 330 Chandler St., Worcester, Mass. "Bennett," "Handy."

BENNETT—See Bay State Stamping Co.

BOWEN Mfg. Co., Auburn, N. Y.
(See page 117.)

DETROIT Lubricator Co., Detroit, Mich.
(See page 677.)

ELLIOTT Chemical Works, Newton, Mass.

GITS Bros. Mfg. Co., 557 W. Monroe St., Chicago, Ill.

GREER, Frederic, 525 W. Van Buren St., Chicago, Ill.

HANDY—See Bay State Stamping Co.

McRAE & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

TUCKER, W. H. & C. F., Hartford, Conn.
(See page 193.)

WAHLSTROM Tool Co., 346 Carroll St., Brooklyn, N. Y.

WINKLEY Co., Detroit, Mich.
(See page 203.)

PAPER SHIPPING COVERS

KENNEDY Car-Liner & Bag Co., Shelbyville, Ind.

SAFEPACK Paper Mills, 411 Court St., Brockton, Mass.

SEINSHEIMER Paper Co., York St. & McLean Ave., Cincinnati, O.

RADIATOR AND HOOD COVERS

(To prevent the water freezing in cold weather)

ALLEN Auto Specialty Co., 1926 Broadway, New York, N. Y.
(See page 163.)

ANTIDAM—See Glover Equipment Co.

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

AUTO Cape Top Co., 2334 Michigan Ave., Chicago, Ill.

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BADGER—See Wisconsin Auto Top Co.

BONDY Mfg. Co., 3112 Euclid Ave., Cleveland, O. "Tesmer," "Imperial."

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

DAFOE-EUSTICE Co., Jefferson Ave. & Antoine St., Detroit, Mich. "Duk-Bak."

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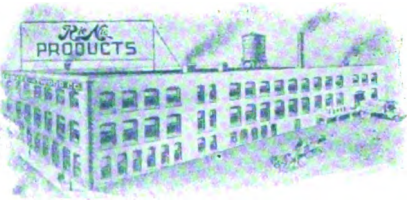
RieNie Products Rejuvenate and Keep in Perfect Running Order, Automobiles, Motorcycles, Bicycles, Motor Boats and Aeroplanes.

OUR *complete* line covers *all* the requirements demanded of chemical renewers, cleaners, lubricating oils and greases. Their lasting quality and practical usefulness are the necessary essentials for a successful line. And RieNie Products have been and are now predominantly popular and successful.



RieNie Products Are Big Sellers

consequently they do not long remain on your shelves, with your capital tied up and not promptly earning profits.

Our Selling Plans will convince all rightly ambitious jobbers and dealers that they should not longer delay selling RieNie Products. Immediately request us to submit our proposition.

THE NATIONAL ASS'N OF AUTOMOBILE MEMBER ACCESSORY JOBBERS

General Offices and Factory

DURKEE-ATWOOD CO.
MINNEAPOLIS, MINN. U.S.A.

Branch Office: 37-39 Murray St., New York, N. Y.

RieNie German Radiator Compound

JUST A TABLESPOONFUL to make a quick and permanent repair. Will not clog the cooling system. Dissolves in the warm water in the Radiator and solidifies when passing through the leak to the air. It sets hard and solid, making a permanent mend in any part of the cooling system, including the water-jackets.

List .....Each $0.75
Twelve in Carton..... 7.50
Dealer discount, 40%

RieNie Graphite Spring Lubricant

Stops the squeak and adds to the easy riding qualities of any car. Puts a graphite coat on every part of the spring leaf. Is not gummy or greasy and does not collect dust. Easily and quickly applied.

List—Pint cans $0.60
36 in case..... 21.60
Dealer discount, 40%

RieNie Valve Grinding Compound

Always Uniform—Not Affected by Climatic Conditions. Is unexcelled for grinding all kinds of valves. This ready mixture is made in a special cutting oil and contains no glass or emery, works very fast and leaves an even, smooth, polished seat. For shop use there are three grades: Coarse, Medium and Fine.

Duplex Cans containing two grades (72 in case).....Each $.25
Shop size containing one grade (50 in case).....Each .50
Dealer discount, 40%.

RieNie Air Drying Black Enamel

Gloss or Semi-Gloss. Air Dries in a few hours to a bone-hardness, making a rich black finish which is very durable. Will not flake or peel off. It may be used for dipping or spraying and will bake excellently.

Quarter Pints (36 in case) Each $.25
Half Pints (36 in case) Each .40
Pints (36 in case)....Each .75
Quarts (24 in case)..Each 1.25
Half Gallons (12 in case) Each 2.25
Dealer discount, 33 1/3%
Supplied in all colors.
Write for color card and prices.

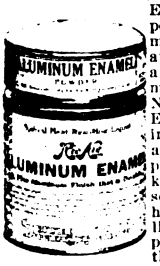
RieNie Cylinder Enamel

Gloss Black, Dull Black, Air Drying—

Prepared especially for automobile cylinders and places where the hot oils frequently splash. Rust or hot oils will not penetrate or affect them in the least. One small can of RIE NIE Cylinder Enamel will make any motor look like new. Will not flake or chip. Each

Quarter Pints (36 in case).....$0.25
Half Pints (36 in case)..... .40
Pints (36 in case)..... .75
Quarts (24 in case)..... 1.25
Half Gallons (12 in case)..... 2.25
Dealer discount, 33 1/3%.

RieNie Aluminum Enamel



Heat Resisting. Especially compounded for the motors, gear cases and radiators of automobiles and motorboats. RIE NIE Aluminum Enamel is put up in a special package having two compartments which keep the powder separate from the heat-resisting liquid and thus prevents settling in the can.

Each
Half Pints (36 in case).....$0.40
Pints (24 in case)..... .75
Dealer discount, 33 1/3%.

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Rie Nie Products

Simplify your bookkeeping by concentrating your orders for these articles on one manufacturer. We will serve you promptly and to your entire satisfaction with quantity, quality and in price.

R&N Rim Paint

A coat of Rie Nie Rim Paint on the rim prevents the casing sticking to the rim—doing away with the annoyance and trouble in changing casings.

R&N Refinishing Outfit

For Fords and other Small Cars.

A sufficient amount of each of the highest grade and best Enamels and Auto Colors designed especially for refinishing all parts of the car, with full instructions. Prepared ready for use and can be applied by any one. The Standard Outfit is all Black, but any combination of colors will be substituted if desired.

Complete Outfit (six in case), each $4.50

Dealer discount, 33⅓%.

R&N Rubber Filler and Cement

A self vulcanizing rubber compound. Better than patches and safer than vulcanizing. Dig-outs, sand blisters and stone bruises are easily repaired and prevent the water and sand from working into the fabric. Satisfactory results assured.

Outfits Complete, (72 in case), each ..... $ .75

Dealer discount 33⅓%.

R&N Nickel Polish

Gives the New Lustre—Preserves the Metal. Is a specially prepared liquid polish for use on Nickel Plating, Silver or Silver Plating, and on German Silver Reflectors. It removes the weather stains, spots, and tarnishes, imparting the beautiful lustre of the original plating. Contains no acid and will not scratch.

	Each
Pints (36 in case)	$.25
Quarts (24 in case)	.40
Half Gallons (12 in case)	.60

Dealer discount 33⅓%.

R&N Metal Polish

For All Metals That Can be Polished.

Will quickly and easily restore the beautiful new lustre to any brass or metal. It does not scratch, for Rie Nie Metal Polish is made of the finest and softest abrasives and highest grade ingredients. Gives the new, original color, and brightness to the metal. It is economical, for it never settles in the can.

	Each
One Pint (36 in case)	$.25
One Quart (24 in case)	.40
One-half Gallon (12 in case)	.60
One Gallon (12 in case)	1.00

Dealer discount 33⅓%.

R&N Clear Glass Solution

Makes motoring safer in stormy weather. Keeps windshield and lamps perfectly transparent in any kind of weather, preventing forming of frost, steam or mist.

List—3-oz. bottles (72 in case), each ..... $ .50

Dealer discount, 33⅓%

R&N Tyre Re-Nu

A specially prepared rubber paint that preserves the casings by filling the small cracks and cuts and waterproofing the fabric. Penetrates, dries quickly and does not powder or rub off. Casings cared for properly with Rie Nie Tyre Re-Nu will give greater mileage. Tire Protection—Means Tire Economy.

	Each
Pints (36 in case)	$0.50
Quarts (24 in case)	.75
Half Gallons (12 in case)	1.50

Dealer discount, 33⅓%

R&N Silver Plating

Gives beautiful, durable silver finish to lamps and other brass and copper parts. Easy to apply.

36 in case, each $0.75

Dealer discount, 33⅓%

Order thru your Jobber

DURKEE-ATWOOD COMPANY, Minneapolis

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Rie Nie Products

DEALERS—You will take the first step toward establishing a worth-while business acquaintance when you send us a postal asking for our trade discount and dealers' proposition. Do it NOW.

R.N.N. Re-Nu Body Polish

Requires very little rubbing.
Leaves a clean, bright surface.

For cleaning and polishing all parts of an automobile, including the metal, woodwork and leather. It removes mud and water spots putting new life into the finish, bringing out the beautiful lustre. Will not crack the varnish. Each

Half pint cans (72 in case).... $ .25
Quart Cans (24 in case)..... .60
Gallon Cans (12 in case)..... 2.00
Dealer discount, 33⅓%.

R.N.N. Mohair Dressing and Waterproofing

An excellent preparation that brings out the original Silky Mohair appearance and waterproofs the material in one application. Is *guaranteed not to stiffen the material or cause the mohair to crust or crack when folded.* Guaranteed to give satisfaction.

Each

Pints (36 in case)..... $ .75
Quarts (24 in case)..... 1.25
Half Gallons (12 in case)..... 2.25
Dealer discount, 33⅓%.

R.N.N. Leather Dressing

Renews Top, Cushions, Pantasote and Rubber Goods. A liquid Dressing which penetrates, softens, preserves and waterproofs auto cushions, tops and all pantasote leather and rubber goods, leaving a rich enamel finish, which is lasting; it does not form a crust or crack; sun, heat or dampness does not affect it. Will not rub off. Works into cracks and tufts. Each

Pints (36 in case)..... $ .40
Quarts (24 in case)..... .75
Half Gallons (12 in case)..... 1.25
Gallons (6 in case)..... 2.25
Dealer discount, 33⅓%.

R.N.N. Gum Shellac

Holds fast, giving best possible results.

Used for dipping gaskets, sealing crank and transmission cases and joints;—protective coat on primary or secondary wiring and other work where tape is used. An ideal all-around cement and may be cut or thinned with alcohol.

2 oz. bottles (72 in case)..... $ .15
½ pt. cans (36 in case)..... .35
1 pt. cans (36 in case)..... .60
1 qt. cans (24 in case)..... 1.00
½ gal. cans (12 in case)..... 1.75
1 gal. cans (12 in case)..... 3.25
Dealer discount, 33⅓%.

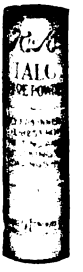
R.N.N. Soldering Paste

Semi-solid, quick acting, effective, easy to apply to difficult out-of-the-way parts.

½ lb. Tins (48 in case)..... $ .30
1 lb. Tins (24 in case)..... .50
Dealer discount, 33⅓%.

R.N.N. Talc Tire Powder

A pure air floated talc of extra fineness and smoothness, which prevents inner tube from heating or sticking to casing.



Each

Having Pasteboard Cans with Metal Sifter Tops, 2" x7¾" (48 in case). $.10

5 lb. Pasteboard Cans (12 in case) .35

Dealer discount, 33⅓%.

R.N.N. Hand Soap

Quickly cleans and leaves the hands softened. Does not injure the skin. Made of vegetable oils and special powder. Removes dirt, grease, oil, ink, etc. List

1 lb. Tin..... $ .10
3 lb. Tin..... .25
6 lb. Tin..... .50
13 lb. Tin..... 1.00

Dealer discount, 25%.

R.N.N. Toilet Soap

Made of the highest grade ingredients slightly and pleasantly perfumed. May be used with or without water. A great convenience and an ideal preparation for the tourist. Each

Pint cans (36 in case)..... $ .25
Quart cans (24 in case)..... .40
Gallon cans (6 in case)..... 1.35
5-gallon cans (1 in case)..... 6.25
10-gallon cans 11.00
Dealer discount, 33⅓%.

R.N.N. Flake Graphite

Is prepared from the purest selected grades of mineral. Is primarily adapted for mixing with either oil or grease, making an excellent lubricant.

Each

½ lb. Tins (36 in case)... $ .25
1 lb. Tins (24 in case)... .40
5 lb. Tins (12 in case)... 1.75
10 lb. Tins (6 in case) ... 3.00
Dealer discount, 20%.

R.N.N. Oil Soap

An Excellent Cleanser for Auto Bodies. A Clean, Pure Vegetable Oil Soap, Semi-Solid. Cleans and Preserves Anything Upon Which Water May Be Used—Restores the Beautiful New Lustre to a Polished Surface. Most economical, giving best results.

5 lb. Litho Tins (12 in case), each .....$ .75
10 lb. Litho Tins (6 in case), each..... 1.40
25 lb. Tins, each..... 3.25
50 lb. Tins, each..... 6.00
100 lb. Keg, each..... 11.00
½ Barrels (about 180 lbs.), per lb..... .10
Barrels (about 350 lbs.), per lb..... .09
Dealer discount, 15%.

Order thru your Jobber

DURKEE-ATWOOD COMPANY, Minneapolis

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RieNie Products

RieNie Oils, Polishes, Greases, Paints, etc., comprise a complete line of fast-selling products yielding liberal returns to jobbers and dealers. Our reputation and our guarantee always protect you.

RieNie Clutch & Brake Compound

Made of pure Neatsfoot Oil and other ingredients of the best quality. Keeps the brake lining soft and in good condition, insuring safety and increasing wearing qualities.

Excellent for use on the clutch, preserving the leather or facing. Sold in special cans for easy application. Special oilers—containing 1 pt. (36-in can), each, 35c. Dealer's discount, 33⅓.

RieNie Fine Parts Oil

Particularly adapted to Magnetos and Dynamos. Cleans, lubricates and prevents rust. Will not gum.

Special 4 oz. oil can, 72 in. case, ea., 25c.

Dealers' discount, 40%.

RieNie Grease "Smoothes the Way"

Dealer discount, 30%.

Made of the very best Petroleum Oil and other high grade ingredients. Climatic conditions will not cause it to soften or harden. Affords the most efficient lubrication and proves positively the most economical. Especially adapted for automobile lubrication and represents the highest standard obtainable. Each.

1 lb. Tins (24 in case)	$.15
5 lb. Tins (12 in case)	.70
10 lb. Tins (6 in case)	1.30
25 lb. Tins (1 in case)	3.00
50 lb. Tins (1 in case)	5.50
100 lb. Kegs	10.00
½ bbls. (180 lbs.)	16 20
Bbls. (350 lbs.)	28.00

RieNie Motor Oil

The very best quality of Pennsylvania Oil filtered by special process to remove free carbon and impurities. Does not contain any acid. Absolutely uniform in quality at all times. Four grades—light, medium, heavy and extra heavy.

1-gal. can, 12 in case, each	.85
5-gal. can, each	$3.00
10-gal. can, each	5.75
½ bbl. (approx. 30 gal.), gal.	.55
Bbls. (approx. 50 gal), gal.	.50

(For Extra Heavy add 15c. per gal.)

Heavy steel drums and faucets in place of half barrels and barrels, 5c. per gal. extra. Dealer discount 30%.

RieNie Winter Fluid

Is the result of infinite pains taken by the Leading Chemists of this country. Less expensive and more satisfactory than Alcoholic Mixtures, for it does not freeze, boil or evaporate at any temperature it is subject to in the use of an automobile cooling system. One-gallon can, list, $1.25 (six to the case). Dealers' discount 40%.

RieNie Gear Oil, 1 gal., 75¢; bbl., 65¢; disc., 33⅓%.

RieNie Chain Lubricant, 1 lb. tins, 30¢; 50 lb. tins, 20¢; disc., 33⅓%.

RieNie Rust & Scale Remover, 1 lb. can, 75¢; 5 lb. cans, $2.50.

RieNie Carbon Remover, qts., 75¢; ½ gals., $1.25; disc., 33⅓%.

RieNie Prussian Blue, 2 oz. tubes, 15¢; discount, 20%.

RieNie Mohair Top & Seat Cover Cleaner, qts., 50¢; ½ gals., 90¢; gals., $1.75; disc., 33⅓%.

RieNie Lining Top Dye, pints, 50¢; qts., 75¢; disc., 33⅓%.

RieNie Carborundum, ½-lb. cans, 25¢; lb. cans, 40¢; 5 lb. cans, $1.50; 10 lb. $2.75; disc., 33⅓%.

RieNie Tire Mica, can 15¢; 5 lb. cans, 50¢; disc., 20%.

RieNie Special Motor Oil for Fords, gals., 60¢; 10 gals., 40¢; bbls., 35¢; steel drums, 38¢; disc., 15%.

RieNie Graphite Spring Inserts, $2 per box of 100; disc., 40%.

RieNie Brazing Compound, lb. package, 60; disc., 33⅓%.

RieNie Cements for patching and vulcanizing, ¼-pt., 15¢; ½-pt., 25¢; 1 pt., 45¢; disc., 40%.

If your jobber cannot immediately fill your orders for our products send us his name and we will ship you direct—and advise your jobber to bill you in the regular way.

DURKEE-ATWOOD CO.
MINNEAPOLIS, MINN. U.S.A.

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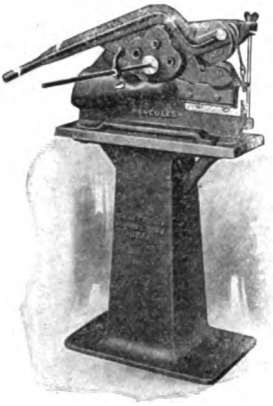
HERCULES SHEARS & ROD CUTTERS



IN SIX SIZES

No. 0 Tool Makers' Bench Shear and Rod Cutter — cuts one-quarter inch iron rod or under, one-sixteenth inch flat iron or under. The shear blades have a draw-in cut, with no tendency to crowd work out of the shear. Note that leverage is directly over the cutting point, pressure is applied by rolling contact. Jaw is lifted with steel band, dispensing with all springs.

SEND FOR SHEAR CATALOGUE

Nos. 1, 2 and 5 — Nos. 3 and 4

No. 1—Cuts ½" iron rod or under, 3/16" flat iron or under
No. 2—Cuts ⅝" iron rod or under, ¼" flat iron or under
No. 5—Cuts ¾" iron rod or under, 5/16" flat iron or under
No. 3—Cuts flat sheets or bar iron ¼" or under only
No. 4—Cuts flat sheets or bar iron 5/16" or under only

Manufactured and for sale by

W. H. & C. F. TUCKER, Hartford, Conn., U.S.A.

TUCKER OIL HOLE COVERS

Send for Catalogue of Oil Hole Covers, and Discounts. State Quantity. Samples Sent on Request.

W. H. & C. F. TUCKER, Hartford, Conn.

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COVERS (Continued)

RADIATOR AND HOOD COVERS (Continued)

DETROIT Slip Cover Co., 22 Hendrie Ave., Detroit, Mich. "Pro-Tec-Shun."

DUK-BAK—See Dafoe-Eustice Co.

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

GILLIAM Mfg. Co., Canton, O.

GLOBE Seat Cover Co., Racine, Wis.

GLOVER Equipment Co., Indianapolis, Ind. "Antidam."

GORDON Co., J. P., 302 N. Forth St, Columbus, O.
(See page 195.)

GOSS Co., J. C., 16 Woodbridge St., E., Detroit, Mich.

HANISCH Sons, R., 121-23 N. Halsted St., Chicago, Ill.

IMPERIAL—See Bondy Mfg. Co.

KNAPP Co., A. C., 1735 Mt. Elliott Ave., Detroit, Mich.

LADOW, Clinton, Asbury Park, N. J.

McKINNON Dash Co., 252 Amherst St., Buffalo, N. Y.

MARTIN Mfg. Co., Forest Rose Ave., Lancaster, O.
(See page 807.)

MONARCH Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PHILLIPS Auto Seat Cover Co., 244-50 W. 49th St., New York, N. Y.
(See page 685.)

PREMIER Auto Novelty Mfg. Co., 875 W. Broadway, New York, N. Y.

PRO-TEC-SHUN—See Detroit Slip Cover Co.

SIMON & Co., S. C., 404-12 Brown St., Philadelphia, Pa.

TESMER—See Bondy Mfg. Co.

VEHICLE Top & Supply Co., 3414 Lindell Ave., St. Louis, Mo. "Vesco."

VESCO—See Vehicle Top & Supply Co.

WILCOX Co., M. I., Water St., Toledo, O.
(See page 805.)

WISCONSIN Auto Top Co., 1517 17th St., Racine, Wis. "Badger."
(See page 531.)

SLIP COVERS

(See also Tops, Automobile)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BADGER—See Wisconsin Auto Top Co.

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CAMPBELL—See Perkins Campbell Co.

CENTRAL Auto Top Co., 421-25 N. Capitol Blvd., Indianapolis, Ind.

CHICAGO Auto Equipment Co., 808-10 W. Jackson Blvd., Chicago, Ill.

COLUMBUS Mfg. & Supply Co., 830-32 Ninth Ave., New York, N. Y.

COOLING Carriage Co., 402 French St., Wilmington, Del.

DETROIT Slip Cover Co., 22 Hendrie Ave., Detroit, Mich. "Pro-Tec-Shun."

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

GATES Mfg. Co., 431 N. Capitol Ave., Indianapolis, Ind.

GECO—See Glover Equipment Co.

GLOBE Seat Cover Co., Racine, Wis.

GLOVER Equipment Co., Indianapolis, Ind. "Geco."

GORDON Co., J. P., 302 N. Forth St., Columbus, O.
(See page 195.)

HARTMAN-TOWNSEND Co., 14th & West Sts., Indianapolis, Ind.

HERRITY Co., E. A., 60 Summer St., Stamford, Conn.

HOLMES & Bostrom Bros., 915 National Ave., Milwaukee, Wis.

HYATT Auto Top Co., 210-20 Wood St., Trenton, N. J.

KNAPP Co., A. C., 1735 Mt. Elliott Ave., Detroit, Mich.

MACK Mfg. Co., Lancaster, Pa.

MOORE & Co., 647 W. 50th St., New York, N. Y. "Right Fit."

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

ONE-MAN Top & Supply Co., Dryden Bldg., Flint, Mich.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

PHILLIPS Auto Seat Cover Co., 244-50 W. 49th St., New York, N. Y. "Sure Fit."
(See page 685.)

PREMIER Auto. Novelty Mfg. Co., 875 W. Broadway, New York, N. Y.

PRO-TEC-SHUN—See Detroit Slip Cover Co.

RIGHT FIT—See Moore & Co.

SNOW-MOSS Co., 147 W. 83d St., New York, N. Y.

STANDARD Auto Top Co., 1338 Race St., Philadelphia, Pa.

SURE FIT—See Phillips Auto Seat Cover Co

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O.
(See page 211.)

WILCOX Co., M. I., Water St., Toledo, O.
(See page 805.)

WISCONSIN Auto Top Co., 1517 17th St., Racine, Wis. "Badger."
(See page 531.)

STARTING CRANK COVERS

(See Holders, Starting Crank)

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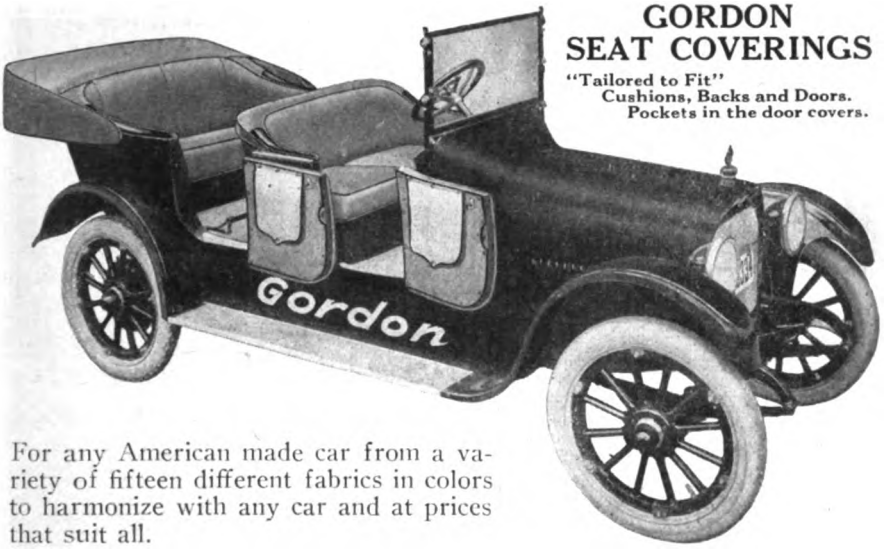
GORDON SEAT COVERINGS

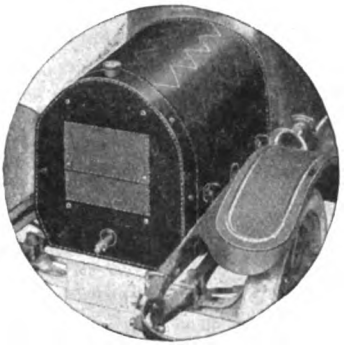
"Tailored to Fit"
Cushions, Backs and Doors.
Pockets in the door covers.



For any American made car from a variety of fifteen different fabrics in colors to harmonize with any car and at prices that suit all.

"Gordon" No. 1221 Special Holder Tire Cover

The only WEATHER PROOF COVER that can be used with spare tires carried on the rear rim carrier found on late models or such cars as Buick, Hupmobile, Maxwell, Overlands, etc.



You can make your "getaway" as quickly in cold as in warm weather if your engine is protected by *"Gordon" Radiator and Engine Robe.* Keeps the heat in and cold out. Insures against delays and non-use of your car. Provides for as constant service in winter as in summer.

GORDON NECESSITIES FOR FORDS

One-Man Top

Note graceful lines and rounded effect like high priced cars. Supported to body at windshield by steel rods. Swaying and rattling impossible.

Top Recovering

Old tops made new. Same material as original. Roof, quarter, back, stays and back curtain cut to fit old bows perfectly, ready to put on.

Rear Curtain Light

Replace that broken rear curtain light with this one yourself. No sewing required. Quickly attached by means of special fasteners supplied.

BIG PROFITS FOR DEALERS

THE J. P. GORDON CO.

No. 302 No. Forth Street **COLUMBUS, OHIO**

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COVERS (Continued)

STEERING KNUCKLE COVERS

(See Boots, Steering Knuckle)

STEERING WHEEL COVERS OR GRIPS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

EZE-GRIP—See Hayne-Surridge Auto Goods Co.

HAYNE-SURRIDGE Auto Goods Co., 1017 Lucas Ave., St. Louis, Mo. "Eze-Grip."

NATHAN Novelty Mfg. Co., A84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PARKER-STEARNS & Co., 206 Sheffield Ave., Brooklyn, N. Y.

TIRE COVERS

(See Cases, Tire and Tube)

TOP COVERS

(See also Tops, Automobile)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CENTRAL Auto Top Co., 421-25 N. Capitol Blvd., Indianapolis, Ind.

DETROIT Slip Cover Co., 22 Hendrie Ave., Detroit, Mich. "Pro-Tec-Shun."

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

FISHER Auto Top Co., Norwalk, O.

GECO—See Glover Equipment Co.

GLOVER Equipment Co., Indianapolis, Ind. "Geco."

HANISCH Sons, R., 121-123 N. Halsted St., Chicago, Ill.

LONDON Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

MILWAUKEE Trimming Co., 549 E. Water St., Milwaukee, Wis.

NATHAN Novelty Mfg. Co., A84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

PHILLIPS Auto Seat Cover Co., 244-50 W. 49th St., New York, N. Y.
(See page 685.)

PRO-TEC-SHUN—See Detroit Slip Cover Co.

SPRINGFIELD Auto Top & Upholstery Co., Sanford St., Springfield, Mass.

VESCO—See Vehicle Top & Supply Co.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O.
(See page 211.)

CRANKS

SAFETY STARTING CRANKS

FRENCH, Charles A., 2543-45 E. Johnson St., Madison, Wis.
(See page 619.)

PERKINS & Son, B. F., 2 Crescent St., Holyoke, Mass.

PROSSER Engineering Co., 2105 W. Superior Ave., Cleveland, O.

WINK Mfg. Co., 2100 W. Superior Ave., Cleveland, O.

CRANKSHAFTS

FINISHED OR MACHINED CRANKSHAFTS

(For Crankshafts in the rough—See Forgings, Drop)

ALLISON & Co., Fifth & Market Sts., Chester, Pa.

ATLAS Mfg. Co., Fosteria, O.
(See page 197.)

AUTO Crankshaft Co., 192-96 Piquette Ave., Detroit, Mich.
(See page 201.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

GILL & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y.

JACKSON Motor Shaft Co., Jackson, Mich.
(See page 131.)

JOLIET Forge Co., Irving & Franklin Sts., Joliet, Ill.

LADISH-OBENBERGER Co., Cudahy, Wis.
(See page 799.)

LELAND-GIFFORD Co., 1025 Southbridge St., Worcester, Mass.

MOLTRUP Steel Products Co., Beaver Falls, Pa.
(See page 705.)

NATIONAL Engineering Co., Saginaw, Mich.
(See page 827.)

NORTON Grinding Co., New Bond St., Worcester, Mass.

PARK Drop Forge Co., Cleveland, O.
(See page 199.)

PENINSULA Auto Parts Co., 46 Lafayette Ave., E., Detroit, Mich.

STANDARD Gauge Steel Co., Beaver Falls, Pa.
(See page 813.)

SUNDBERG Co., Kinzie & Carpenter Sts., Chicago, Ill.

TINDELL-MORRIS Co., Eddystone, Pa.

UNION Drop Forge Co., 358 W. Indiana St., Chicago, Ill.

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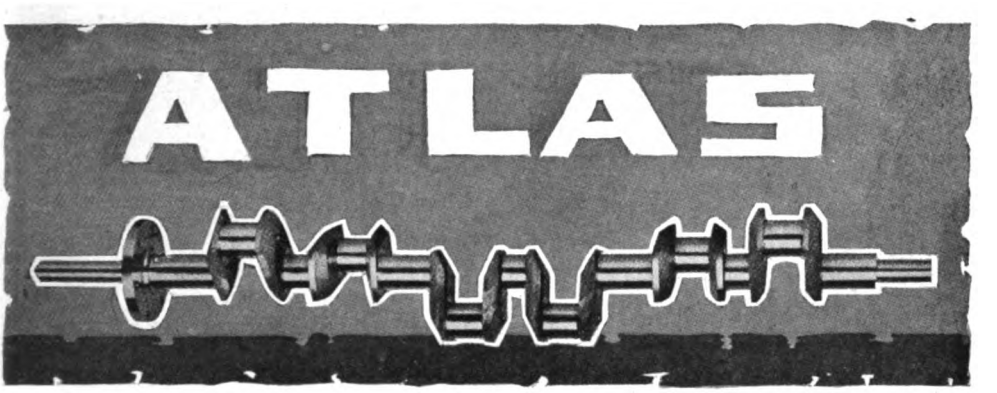

Our new plant with the most modern and complete equipment is devoted entirely to the machining of

CRANKSHAFTS

Ten years' experience, on work for the most exacting motor builders, places us in an incomparable position to serve you.

ATLAS MANUFACTURING CO.

FOSTORIA **OHIO**

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CUPS

BALL CUPS AND CONES

ASHLEY Machine Works, 724 University Ave., Rochester, N. Y.
(See page 323.)

AUBURN Ball Bearing Co., 27 Elizabeth St., Rochester, N. Y.
(See page 111.)

BOSSERT Co., Utica, N. Y.
(See page 279.)

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

CROSBY Co., Buffalo, N. Y.
(See page 699.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn.
(See page 383.)

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

MICHIGAN Screw Co., Lansing, Mich.

OAKES Pressed Steel Co., Indianapolis, Ind.

PENINSULAR Milled Screw Co., 1090 Lafayette St., E. Detroit, Mich.

REESE Machine & Tool Works, S., 324-30 W. Main St., Plymouth, Pa.

U. S. Automatic Co., Amherst, O.

WESTERN Automatic Machine Screw Co., Elyria, O.

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

OIL AND GREASE CUPS

(See also Lubricators; also Covers, Oil Hole)

ACTIVE—See Sherman Mfg. Co.

AGNER Co., Raymond C., Burlington, Wis. "Simplex."

AIRSPRING—See Hunter Pressed Steel Co.

AJAX—See Allen Mfg. Co.

AJAX—See City Iron Works & Machine Co.

ALBANY Lubricating Co., 708-10 Washington St., New York, N. Y. (Grease Cups only.)

ALLEN Mfg. Co., W. D., 133-35 W. Lake St., Chicago, Ill. "Columbia," "Peerless," "Gibbs," "Ajax," "Polar," "Pawnee," "Reliable."

AMERICAN Brass Novelty Co., Grand Haven, Mich.

AMERICAN Injector Co., 173 14th Ave., Detroit, Mich.

AMERICAN Lubricator Co., Summit Ave. & Wabash Ry., Detroit, Mich.

AMERICAN Pin Co. (Waterville Station), Waterbury, Conn.

AMERICAN Stamping Co., Battle Creek, Mich.

ARROW—See Long Bros.

ATLAS—See Lunkenheimer Co.

BAILEY Co., Wm. J., 401-07 Mulberry St., Newark, N. J. "Climax."

BAY State Stamping Co., 330 Chandler St., Worcester, Mass.

BEAR—See Powell Co.

BESLY & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill. "Helmet."

BOWEN Mfg. Co., Auburn, N. Y. "Empress."
(See page 117.)

BRUNO—See Powell Co.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

BURNS & Bassick Co., Bridgeport, Conn.
(See page 211.)

CAMDEN—See Lindholm Metal Stamping Co.

CARDINOL—See Lunkenheimer Co.

CHICAGO—See Ohio Injector Co.

CITY Iron Works & Machine Co., 520 S. Delaware Ave., Philadelphia, Pa. "Ajax," "Larg-Hex."
(See page 795.)

CLIMAX—See Bailey Co.

COIN—See Powell Co.

COLONIAL—See Powell Co.

COLUMBIA—See Allen Mfg. Co.

CONSORT—See Powell Co.

CRANE Co., 836 S. Michigan Ave., Chicago, Ill.

CUTTER—See Long Bros.

DETROIT Lubricator Co., Detroit, Mich.
(See page 677.)

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EMPRESS—See Bowen Mfg. Co.

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

EXETER Brass Works, Exeter, N. H.

GEM—See Lunkenheimer Co.

GIBBS—See Allen Mfg. Co.

GITS Bros. Mfg. Co., 557 W. Monroe St., Chicago, Ill.

GREER, Frederic, 525 W. Van Buren St., Chicago, Ill.

GUARDIAN—See Sherman Mfg. Co.

HELMET—See Besly & Co.

HENRY Mfg. & Grease Cup Co., Terre Haute, Ind.

HUNTER Pressed Steel Co., Orthodox & Horrocks Sts., Philadelphia, Pa. "Airspring."

IDEAL—See Lunkenheimer Co.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

JEWEL—See Lunkenheimer Co.

KELLY & Jones Co., Greensburg, Pa.

LARG-HEX—See City Iron Works & Machine Co.

LINDHOLM Metal Stamping Co., 107-15 Erie St., Camden, N. J. "Vale," "Camden," "Madeira," "McKee," "Simplex," "Reno."
(See page 851.)

LION—See Lunkenheimer Co.

LONG Bros., Broadway & Buckeye St., Kokomo, Ind. "Arrow," "Cutter."

LUNKENHEIMER Co., 228 E. Eighth Ave., Cincinnati, O. "Ideal," "Lion," "Pioneer," "Royal," "Sentinel," "Tiger," "Gem," "Cardinol," "Mite," "Majestic," "Jewel," "Owl," "Atlas," "Reliance," "Primo," "Wingo," "Securo."

M & E—See Merchant & Evans Co.

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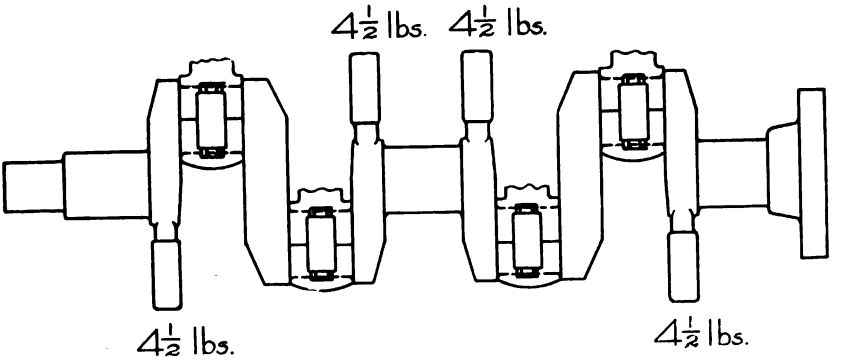
COUNTERBALANCED PARK CRANKSHAFTS



Average weight of counterbalances, 4 to 5 lbs. each

Each cylinder balanced separately. Each crank arm + each crank pin and + each big end of connecting rods correctly counterbalanced.

RESULT

Less vibration
Increased speed
Reduced bearing friction
More power, smoother running motor with crankshaft balanced at all speeds.

THE PARK DROP FORGE COMPANY
CLEVELAND

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CUPS (Continued)

OIL AND GREASE CUPS (Continued)

McKEE—See Lindholm Metal Stamping Co.

McRAE & Roberts Co., 221-35 Campbell Ave., Detroit, Mich.

MAC—See Powell Co.

MADEIRA—See Lindholm Metal Stamping Co.

MAJESTIC—See Lunkenheimer Co.

MASCOT—See Powell Co.

MECCA—See Powell Co.

MERCHANT & Evans Co., Philadelphia, Pa. "M. & E."
(See page 405.)

MICHIGAN Lubricator Co., 661-78 Beaubein St., Detroit, Mich.

MIKADO—See Powell Co.

MILWAUKEE Valve Co., 189 Burrell St., Milwaukee, Wis.

MITE—See Lunkenheimer Co.

MOGUL—See Powell Co.

MONITOR Lubricating Co., 1218 Chestnut St., Philadelphia, Pa.

NATIONAL Brass Mfg. Co., 191-98 Mill St., Rochester, N. Y.

OHIO Injector Co., Wadsworth, O. "Chicago."

OWL—See Lunkenheimer Co.

PAWNEE—See Allen Mfg. Co.

PEERLESS—See Allen Mfg. Co.

PENBERTHY Injector Co., Detroit, Mich. "Sterling."
(See page 137.)

PENN Pressed Metal Co., Newton Ave. & Line St., Camden, N. J.

PERFECT—See Sherman Mfg. Co.

PIONEER—See Lunkenheimer Co.

POLAR—See Allen Mfg. Co.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. "Mogul," "Progress," "Renown," "Vanguard," "Colonial," "Mecca," "Consort," "Mac," "Bruno," "Bear," "Coin," "Mascot," "Mikado."
(See page 781.)

PREMIUM—See Sherman Mfg. Co.

PRIMO—See Lunkenheimer Co.

PROGRESS—See Powell Co.

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

RELIABLE—See Allen Mfg. Co.

RELIANCE—See Lunkenheimer Co.

RENO—See Lindholm Metal Stamping Co.

RENOWN—See Powell Co.

RICH Mfg. Co., 370 Atlantic Ave., Boston, Mass.

ROYAL—See Lunkenheimer Co.

SECURO—See Lunkenheimer Co.

SENTINEL—See Lunkenheimer Co.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich. "Premium," "Perfect," "Guardian," "Active."

SIMPLEX—See Agner Co.

SIMPLEX—See Lindholm Metal Stamping Co.

STAHL Mfg. Co., 983 17th Ave., S. E., Minneapolis, Minn.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

STERLING—See Penberthy Injector Co.

SWIFT Lubricator Co., 729 W. Second St., Elmira, N. Y.

TIGER—See Lunkenheimer Co.

TUCKER, W. H. & C. F., Hartford, Conn.
(See page 193.)

VALE—See Lindholm Metal Stamping Co.

VANGUARD—See Powell Co.

WILKINSON Co., Wm. H., West Medway, Mass.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

WINGO—See Lunkenheimer Co.

WINKLEY Co., Detroit, Mich.
(See page 203.)

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

ZERK Mfg. Co., Cleveland, O.

SPRING KEY PRIMING CUPS

(For ordinary priming cups—See Cocks, Standard Pet)

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

AMERICAN Injector Co., 178 14th Ave., Detroit, Mich.

AMERICAN Lubricator Co., Summit Ave. & Wabash Ry., Detroit, Mich.

BECCO—See Michigan Motor Specialties Co.

CRUM-WILEY Mfg. Co., Peru, Ind.

DETROIT Brass Works, 1304 Brooklyn Ave., Detroit, Mich.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

KING, W. C., 911 Sargent St., Litchfield, Ill.

LUNKENHEIMER Co., 228 E. Eighth Ave., Cincinnati, O.

McRAE & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

MICHIGAN Lubricator Co., 661-78 Beaubien St., Detroit, Mich.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

NATIONAL Brass Mfg. Co., 191-98 Mill St., Rochester, N. Y.

PENBERTHY Injector Co., Detroit, Mich.
(See page 137.)

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

SOUTH Park Mfg. Co., Port Huron, Mich.

STANDARD Brass Works, 97-109 Wight St., Detroit, Mich.

STERLING & Skinner Mfg. Co., Russell St. & E. Grand Blvd., Detroit, Mich.

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CUPS (Continued)

SPRING LEAF OILING CUPS

AUTO Devices Co., 3214 Locust St., St. Louis, Mo. "Pamco."
(See page 715.)

BABBITT Spring Oiler Co., 211 High Ave., Cleveland, O.

BROWN Spring Oiler Co., 7007 Carnegie Ave., Cleveland, O.

GRUS Leaf Spring Oiler Co., 1536 Michigan Ave., Chicago, Ill.

JEAVONS—See S. & S. Mfg. Co.

LAZARUS Mfg. Co., Belmont Bldg., Cleveland, O. "Lazco."

LAZCO—See Lazarus Mfg. Co.

LEATHER Tire Goods Co., Niagara Falls, N. Y.
(See pages 82 and 83.)

MARVEL—See Mustee Mfg. Co.

MUSTEE Mfg. Co., 3008 Cedar Ave., Cleveland, O. "Marvel."

PAMCO—See Auto Devices Co.

S. & S. Mfg. Co., 1227 Prospect Ave., S. E., Cleveland, O. "Jeavons."

STERLING Mfg. Co., Blackstone Bldg., Cleveland, O.

CURTAINS

SPECIAL TOP CURTAINS

COLLINS—See Novelty Leather Works.

HOLMES & Bostrom Bros., 915 National Ave., Milwaukee, Wis.

JIFFY Auto Curtain Co., Dodge Power Bldg., Detroit, Mich.

NOVELTY Leather Works, Jackson, Mich. "Collins."

STANDARD Auto Top Co., 1888 Race St., Philadelphia, Pa.

CUSHIONS

SPECIAL SEAT CUSHIONS

(For ordinary cushions—See Bodies; also Tops)

PERFECTION—See Pneumatic Mfg. Co.

PNEUMATIC Mfg. Co., 526 17th St., Brooklyn, N. Y. "Perfection."

CUT-OUTS

THERMOSTATIC CUT-OUTS

(For automatically cutting out charging current if battery becomes overheated)

STAWIL Co., 114 S. Sixth St., Quincy, Ill.

CYLINDERS

FINISHED OR MACHINED CYLINDERS

(For cylinder castings in the rough—See Casting, Gray Iron)

DETROIT Foundry Co., N. Grand Blvd. & Riopelle St., Detroit, Mich.

FERRO Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

FULTON Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

MUNCIE Foundry & Machine Co., Muncie, Ind.
(See page 149.)

NEW Standard Foundry Co., Detroit, Mich.

SOWERS Mfg. Co., 1300-10 Niagara St., Buffalo, N. Y.

WAINWRIGHT & Son, W. W., Connersville, Ind.
(See page 797.)

REGRINDING OF CYLINDERS

ALLEN & Curtiss Co., Mishawaka, Ind.
(See page 807.)

Anderson Auto Repair, H. S., 211-19 N. Sheridan Ave., Pittsburgh, Pa.

AUTO Engine Works, St. Paul, Minn.
(See page 219.)

BERNHARD & Turner Automobile Co., 506-12 W. Seventh St., Des Moines, Ia.

BRACKEN, Harry L., rear 27 S. State St., Salt Lake City, Utah.

BRIDGEPORT Piston Ring Co., Connecticut Ave. & Third St., Bridgeport, Conn.

BURT Motor Car Co., W. J., Pico & Hope Sts., Los Angeles, Cal.

BUTLER Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind.
(See page 747.)

DEMSTER, W. R., 1316-18 Oak St., Kansas City, Mo.

DURHAM Co., P. J., 244 W. 49th St., New York, N. Y.

DYER Co., G. H., 155 Brookline St., Cambridge, Mass.

EVARTS Machine Co., 14 Hicks St., Hartford, Conn.

GREEN Engineering Co., Dayton, O.
(See page 869.)

HAWKEYE Truck & Repair Co., Sioux City, Ia.

HEALD Machine Co., 22 New Bond St., Worcester, Mass.

HINGLEY, J. A., 1816-18 Blake St., Denver, Colo.

HOUPERT Machine Co., 349 W. 52d St., New York, N. Y.
(See page 847.)

JOHNS, W. H., 908-12 W. Pico St., Los Angeles, Cal.

LAKE Sales Co., 1947 Broadway, New York, N. Y.
(See page 867.)

LARKIN Auto Machine Co., 454 Golden Gate Ave., San Francisco, Cal.

McCADDEN Machine Works, St. Cloud, Minn.

MERRITT Co., S. Whyle, 311 W. 59th St., New York, N. Y.

NILSON-MILLER Co., 13th & Hudson Sts., Hoboken, N. J.

PATCH Co., E. A., 17 Ipswich St., Boston, Mass.

PONDELICK'S Piston Ring Co., 215 S. Leavitt St., Chicago, Ill.

Complete Index to Classification appears on Pages 8 to 27.

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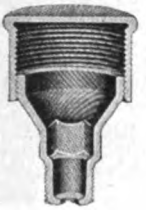
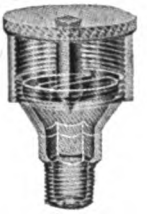
GREASE CUPS WINKLEY SPRING BOLTS



Plain, compressed brass and steel. (Combinations means brass cups and steel base.) Patented pressure makes these Cups wonderfully uniform and practical.

DESCRIPTIVE LIST

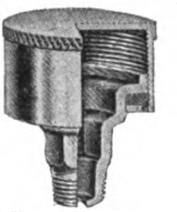
No.	Inside Dia. Cup	Reg. Pipe Thread	Optional Pipe Thread	Optional Female Pipe Thread	In Oz. Capacity
000	¼	⅛	1/16-32		½
00	½	⅛	¼	⅛	½
0	1¼	¼	⅜	⅜	1
1	1½	¼	½	⅜	1½
2	2	¼	¼	⅜	3
3	2½	¼	1/4 or ⅛	⅜	5
4	3	½	⅜	⅜	7



For simplicity, effectiveness and reliability, there is nothing like the RATCHET GREASE CUP. The cap absolutely cannot jar off. Has the appearance of a regular pressed metal cup with locking device entirely inside. Made of brass, steel, or combination. Sizes and description same as the next column.

HINGE TOP OILER

Has greater capacity than cast cups. Furnished in three sizes, namely ¾", 1", 1¼". Plain Polished or Nickel Plated finish with ¼" or ⅜" pipe threads. Construction of Cup enables you to turn same to open in any direction required. Complete line of sizes tapped to size for above cups.



LEATHER WASHER GREASE CUP of pressed metal. Made in brass, steel or combination. LEATHER WASHER prevents grease from working through the threads and gives a tension which keeps the cap from jarring off. Note that LEATHER WASHER is crimped in by our own patented process so that it cannot possibly loosen. Same sizes as plain compressed grease cups given in second column.

"STERLING" SHACKLE BOLTS

Bolts are made of open hearth, cold rolled steel hardened in boiling oil by scientific process. "Hex" or round heads fitted with "STERLING" (as shown in cut) or Acorn heads. Assortment are of brass furnished in any finish. Plunger type force feed. Very efficient and neat in appearance.

"DUSTPROOF" GREASE CUP

This is a self-locking Cup on which the Cap is locked by a cylindrical dustproof shell. Also made as assembly on shackle bolts. This Cup can be furnished with standard Cap if so desired.

"STERLING" GREASE CUP

(*Patented*)

This is a force feed leather-packed plunger cup with a locking device in the base. Cannot rattle loose. Handle never projects more than shown in the cut. Also made on Shackle Bolts as shown on this page with or without "hex" head. This is an excellent and standard device.

"ACORN" GREASE CUP

(*Patented*)

This Cup is constructed the same as the "Sterling" with the exception of the handle, which gives it a very neat appearance. It is becoming very popular with the trade being adaptable for use on shackle bolts.

"WINKLEY" RATCHET BOLTS

Manufactured from same grade of material as Bolt on opposite side of page. Equipped with less expensive assembly. Plain cap made from brass or steel in any finish required. Square post in cap which engages spring in head of bolt. Most effective and reliable Ratchet of simple construction on the market. Very economically furnished in large quantities.

"M" OIL HOLE COVER

Opens in any direction by using spout of oil can to tip cover. Closes automatically.

STANDARD PRICE LIST AND SIZES

No.	Stock Diam.	Thread Pitch	Optional Pipe Thread	Diam. of Cap	Size of Hole	Price per 100
1	¼	32		⅝	⅛	$7 00
2	⅜	32	¼-32	⅞	⅛	9 50
3	½	24	⅛	1	⅛	10 70
4	⅝	24	¼	1⅛	⅛	12 50
5	⅞	24	¼	1⅜	⅛	16 00
6	⅞	24	¼ or ⅛	1⅜	¼	22 00
7	⅞	Pipe	¼	⅞	1	20 00
8	⅞	Pipe	¼ or ⅜	1	1⅛	30 00

We keep all sizes of taps in stock for others. We always send nickel plated finish and stock threads unless specified otherwise.

Write for samples and prices, stating quantity desired.

Give style and number in ordering.

"N" OIL HOLE COVER

Sets very low. Opened in any direction with oil can spout. Closed automatically.

STANDARD PRICE LIST AND SIZES

No.	Stock Diam.	Thread Pitch	Diam. of Hex.	Diam. of Cap	List per 100 Nickeled
1	¼	32	¼	⅝	$7 00
2	⅜	32	⅜	⅞	9 50
3	½	24	½	1	10 70
4	⅝	24	⅝	1⅛	12 50
5	⅞	24	⅞	1⅜	16 00

"D" OIL HOLE COVER

Self-closing, dust-proof. Coil spring of piano wire. Always closes it.

STANDARD PRICE LIST AND SIZES

No.	Stock Diam.	Thread Pitch	Optional Pipe Thread	Diameter of Cap	List per 100
0	10	32		⅜	$7 00
1	¼	32		½	7 00
2	⅜	32		⅝	9 50
3	½	24	¼	⅞	10 70
4	⅝	24	¼	1	12 00
5	⅞	24	¼	1⅛	16 00

"A" HOLE OIL COVER

Made with shoulder at top to drive in when assembled. Self-closing, dust-proof. Requires the use of only one hand of operator.

STANDARD PRICE LIST AND SIZES

No.	Diameter	Length	Drive Into	List per 100
0-A	¼	⅜	¼	$4 00
1-A	⅜	½	⅜	5 00
2-A	½	⅝	½	6 25
3-A	⅝	⅞	⅝	7 50
4-A	⅞	⅞	⅞	8 75
5-A	⅞	⅞	⅞	10 00
6-A	⅞	⅞	⅞	12 00

Nickel Plated Oilers always sent.

"K" OIL HOLE COVER

Has a Hex shoulder which provides means of screwing into bearing. Self-closing, dust-proof. Extends slightly.

LIST OF STANDARD SIZES AND PRICES

No.	Diameter Hex	Thread	List per 100
20-K	⅜	.201-32	$4 00
21-K	½	1/4-32	4 70
22-K	⅝	5/16-24	5 20
23-K	⅞	⅜ Pipe	6 00
24-K	⅞	½ Pipe	7 50
25-K	⅞	⅝ Pipe	10 50

"C" OIL HOLE COVER

Not self-closing, but easily closed by hand. Screw-driver slot. Cannot come apart.

STANDARD PRICE LIST AND SIZES

No.	Thread	Optional Pipe Thread	Diameter of Cap	List per 100
0	.10-.132		⅜	$7 00
1	1/4-132		½	7 00
2	5/16-132		⅝	9 00
3	3/8-124	⅛	⅞	10 70
4	7/16-124	¼	⅞	12 50
5	1/2-124	⅜	⅞	16 00

MANUFACT'D BY **The Winkley Co.** DETROIT MICH.

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CYLINDERS (Continued)

REGRINDING OF CYLINDERS (Continued)

SAUCKE Bros., 47 Franklin St., Rochester, N. Y.

STERLING Engine Co., 331 S. Clinton St., Chicago, Ill.

WALL Street Garage, 634-42 Wall St., Los Angeles, Cal.

WESTERN Fixture Co., 573-75 E. Water St., Milwaukee, Wis.

WHITE Auto Repair Co., 219 W. Fourth St., Chanute, Kans.

DASHES

LEATHER DASHES

McKINNON Dash Co., 352 Amherst St., Buffalo, N. Y.

PETERS & Herron Dash Co., Columbus, O.
(See page 617.)

METAL DASHES

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

WOOD DASHES

AMERICAN Veneer Co., 1501 Clinton St., Hoboken, N. J.

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

DETROIT Auto Dash Co., 519-21 Beaubien St., Detroit, Mich.

EGGERS Veneer Seating Co., F., Two Rivers, Wis.

GRAND Rapids Veneer Works, 800-900 Front St., Grand Rapids, Mich.

HABERKORN & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

HANSON-WARD Veneer Co., Bay City, Mich.

HARTFORD Pattern & Model Co., 120 Allyn St., Hartford, Conn.

INDIANA Veneer & Panel Co., New Albany, Ind.

KUNDTZ Co., Theodor, Elm & Winslow Sts., Cleveland, O.

LOUISVILLE Veneer Mills, 1122-40 Fulton St., Louisville, Ky.

NEW Jersey Veneer Co., 258 W. Railway Ave., Paterson, N. J.
(See page 835.)

STANDARD Cabinet Mfg. Co., Peru, Ind.

WIDMAN & Co., J. C., 14th, 15th Sts. & G. T. Ry., Detroit, Mich.

WISCONSIN Seating Co., New London, Wis

DEFLECTORS

LIGHT DEFLECTORS

(See Dimmers or Shades)

DIMMERS

GLARE DIMMERS

(Colored Glass or Celluloid Attachment for Wind Shield)

BRETT Dimmer Co., A. H., Mason City, Ia.

DAZZLE Dimmer Co., 33 Lyman St., Springfield, Mass.
(See page 205.)

EVERGOOD—See Grossman Mfg. Co.

GLARE-OFF Co., 1777 Broadway, New York, N. Y.

GREENLEAF Mfg. Co., Hartford, Conn.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "Evergood."
(See page 829.)

PERKINS & Co., Grand Rapids, Mich.

REYNOLDS Safety Light Shade Co., Oneida, N. Y.

STAUDE Mfg. Co., E. G., 2675 University Ave., St. Paul, Minn.
(See page 205.)

HEADLIGHT DIMMERS OR SHADES

AMCO—See Art Metal Mfg. Co.

ART Metal Mfg. Co., 61st St. & Curtis Ave., Cleveland, O. "Amco."

BRETT Dimmer Co., A. H., Mason City, Ia.

CHANEY Co., L. F., 508 Boler St., Springfield, O.

CHERRY-CLARK Guard & Dimmer Co., 115 S. Dearborn St., Chicago, Ill. "Shaft-O-Lite."

CHICAGO Eye Shield Co., 2300 Warren Ave., Chicago, Ill.

CLEVELAND Steam Gauge Co., 418 W. Prospect Ave., Cleveland, O.

COLUMBUS Ignition Lighter Co., Wyandotte Bldg., Columbus, O.

CONNECTICUT Electric Mfg. Co., Connecticut & Florence Aves., Bridgeport, Conn.

CORNING Glass Works, Corning, N. Y. "Noglare."
(See page 733.)

DAZZLENOTS—See Servus Selling Co.

DIM-A-LITE—See Pellets Magneto Exchange

DIMIT—See Suburban Lighting & Gas Engine Co.

DISTRIBUTORS & Manufacturers Co., 32 W. Washington St., Chicago, Ill. "Monarch."

DIVERGO—See Rotary Products Co.

ECLIPSE—See Vesta Accumulator Co.

FRACTO Specialty Co., 356 Newbury St., Boston, Mass.
(See page 581.)

GLAROSCOPE—See Randall-Faichney Co.

GRAND Rapids Dimmer Co., Grand Rapids, Mich.

H. P. B. Electric Co., 500 Fifth Ave., New York, N. Y.

HASKINS-HONAKER Glass Co., Wheeling, W. Va.

IOWA Optical Co., New London, Ia.

KLEARGLOW—See Parcrid Motor Appliance Co.

LANCASTER Lens Co., 220-26 W. Main St., Lancaster, O. "Star."

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Here's a Great Seller!

STAUDE Glare Stopper

The STAUDE is a disc of pure amber-colored crystal lens glass 6½ inches in diameter, with a nickel-plated clamp for attaching to windshield.

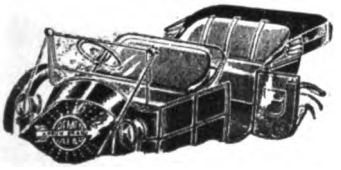
It protects the driver from being blinded by the glare of approaching headlights, reducing the strong rays to a soft glow which illumines the entire roadway, enabling the driver to pick his way with safety.

Dealers everywhere find motorists eager to buy this device. Attractive in appearance, durable in wear, stays in any position. **Price $2.50.**

Write for folders and dealers' discounts.

E. G. Staude Manufacturing Co.
2675 University Avenue St. Paul, Minn.

FOR BETTER PRICES AND BETTER QUALITIES



BEMCO SEAT COVERS

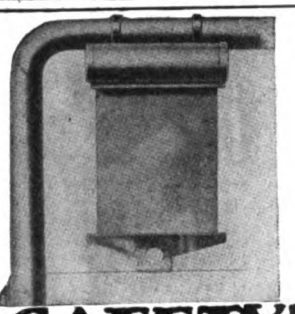
Made for all popular selling cars in all leading fabrics. Fit and workmanship guaranteed. Prompt deliveries. Let us figure with you.

BEMCO TIRE COVERS

Recognized as standard by which all others are judged. None better made or lower priced. Get acquainted with them.

Ask for Complete Catalog

B. E. MFG. CO. 444 Broadway NEW YORK



SAFETY!

From your own experience you know the need of adequate protection against the glare of the headlights of an oncoming car.

You know that every motorist needs not only adequate means of combating the dangerous uncertainty of "driving blind," but to have the best "safety first insurance" the market affords.

The Dazzle Dimmer

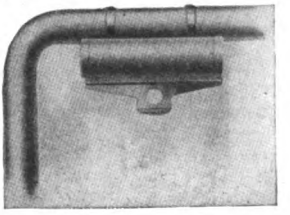
is made on the principle of a curtain. When wanted simply pull it down—when not wanted it rolls up compactly into a small cylinder.

The curtain of the DAZZLE DIMMER is contained in a small cylinder seven inches long and one inch in diameter. It hooks over the top of the windshield and can be moved to any position required. It is the only Dimmer made that will permit looking over the headlights of a coming car and clearly seeing the number of occupants; so thoroughly does it dim and not darken.

Price, $1.50 List

Attractive discount schedule for live dealers who can get the business.

THE DAZZLE DIMMER CO.
33 Lyman St., SPRINGFIELD, MASS



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DIMMERS (Continued)

HEADLIGHT DIMMERS OR SHADES (Continued)

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco."
(See page 617.)

LEGAL-BRITE—See Vesta Accumulator Co.

LEGALITE Corporation, 117 Boylston St., Boston, Mass.

LENNON Mfg. Co., Watson & Main Sts., Willimantic, Conn.
(See page 211.)

LEONARD Electric Co., Ward, Mt. Vernon, N. Y. "Nodaz."

MIDDLETON, J. G., Pittsfield, Mass.

MONARCH—See Distributors & Manufacturers Co.

MONARCH—See Pioneer Lamp Co.

MONARCH Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

MORTON Colorlight Co., 152 Bridge St., Springfield, Mass.
(See page 607.)

N G S Deflector Co., 146 S. Scioto St., Columbus, O.

NEW Ordnance Dimmer Co., Meridian Life Bldg., Indianapolis, Ind.

NOGLARE—See Corning Glass Works.

NO-GLARE—See Perrin Mfg. Co.

NODAZ—See Leonard Electric Co.

O-U-LITE Co., Racine, Wis.
(See page 761.)

OSGOOD Lens & Supply Co., 1241 S. Michigan Ave., Chicago, Ill.

PARCRID Motor Appliance Co., 30 N. Michigan Blvd., Chicago, Ill. "Klearglow."

PELLETS Magneto Exchange, 1606 Michigan Ave., Chicago, Ill. "Dim-a-Lite."

PERCY, F. E., Caxton Bldg., Cleveland, O. "Rexlite."

PERRIN Mfg. Co., Detroit, Mich. "No-Glare."
(See page 623.)

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill. "Monarch."

RANDALL-FAICHNEY Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Glaroscope."

REXLITE—See Percy, F. E.

REXLITE—See Smith-Standard Co.

ROCHE Electric Machine Co., 215-17 N. Division Ave., Grand Rapids, Mich.

ROTARY Products Co., 1013-15 S. Los Angeles St., Los Angeles, Cal. "Divergo."

SELLING & Mfg. Co., Union Bldg., Cleveland, O. "Semilites."

SEMILITES—See Selling & Mfg. Co.

SERVUS Selling Co., 10 Johnson St., Newark, N. J. "Dazzlenots."

SHAFT-O-LITE—See Cherry-Clark Guard & Dimmer Co.

SMITH-STANDARD Co., 7904 Madison Ave., Cleveland, O. "Rexlite."
(See page 825.)

SPRINGFIELD Auto Deflector Co., Mitchell Bldg., Springfield, O. "Wheeler."

STAR—See Lancaster Lens Co.

SUBURBAN Lighting & Gas Engine Co., Summit & Lagrange Sts., Toledo, O. "Dimit."

SUTTERLEY & Co., G. T., 23d & Hamilton Sts., Philadelphia, Pa.

TOBEY, Wm. L., 9 Lewis St. (E. Boston), Boston, Mass.

UNIVERSAL Auto Parts Co., Columbus, O.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill. "Eclipse," "Legal-Brite."

WARNER-LENZ Co., 914 S. Michigan Ave., Chicago, Ill.
(See page 399.)

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WHEELER—See Springfield Auto Deflector Co.

DISCS

RADIATOR DISCS OR FINS

CROSBY Co., Buffalo, N. Y.
(See page 699.)

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

STEEL CLUTCH DISCS

BOSSERT Co., Utica, N. Y.
(See page 279.)

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

DISSTON & Sons, Henry (Tacony), Philadelphia, Pa.

GIER Pressed Steel Co., Lansing, Mich.
(See page 787.)

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

MOLTRUP Steel Products Co., Beaver Falls, Pa.
(See page 705.)

SIMONDS Mfg. Co., North St., Fitchburg, Mass.

DISTRIBUTERS

SPARK DISTRIBUTERS

(See Timers, Ignition)

DRESSING

CLUTCH AND BELT DRESSING

ARMIGER Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."

BLUE RIBBON—See Jobbers' Mfg. Co.

CAMO—See Perkins-Campbell Co.

CLEVELAND Auto-Clutch Dressing Co., Cleveland, O. "Slipnot."

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

ECHO Motor Co., Tonawanda, N. Y.

ENSIGN Refining Co., 10605 Quebec Ave., Cleveland, O.

Complete Index to Classification appears on Pages 8 to 27.

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Four Hot-Weather Necessities from the Campbell Catalog

Does your motor overheat on warm days? Try a Campbell Fan Belt and note the difference.

And what about cool drinks on long hot drives? Why not a Thermos or Icy-Hot Bottle, protected by a Campbell leather case?

Or perhaps you want to drive without your coat, and have no convenient place to carry your watch. Get a Campbell Steering Wheel Watch and have the time right before your eyes.

There's Campbell Detachable Upholstery, too—the coolest upholstery you can find. It takes all the discomfort out of sizzling, sun-baked cushions. It's the smartest, most luxurious accessory you can put on your car.

Dealers: Write for discounts

—and the Campbell proposition. Investigate this live line of useful articles that appeal to the eye and purse of every motorist. Act today. Get the best business of your town with Campbell Guaranteed Motor Car Accessories.

The Perkins-Campbell Co.

634 Broadway — **Cincinnati, Ohio**

New York Branch, 89 Chambers Street — *Chicago Branch, 1329 Michigan Avenue*

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DRESSING (Continued)

CLUTCH AND BELT DRESSING (Continued)

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

JOBBERS' Mfg. Co., 327 S. La Salle St., Chicago, Ill. "Blue Ribbon."

NORTHWESTERN Chemical Co., Marietta, O. "Pioneer." (See pages 172 and 173.)

OWL—See Western Chemical Mfg. Co.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Camo." (See page 207.)

PIONEER—See Northwestern Chemical Co.

REX—See Armiger Chemical Co.

RIE-NIE—See Durkee-Atwood Co.

SLIPNOT—See Cleveland Auto-Clutch Dressing Co.

UNO Mfg. Co., Royal Ins. Bldg., Chicago, Ill.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

WANG—See Van Tilburg Oil Co.

WESTERN Chemical Mfg. Co., 151 Sixth St., Milwaukee, Wis. "Owl."

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

LEATHER DRESSING

ALCOVIE—See Matt & Co.

AMERICAN Lacquer Co., Bruce Ave., Bridgeport, Conn.

ARMIGER Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup." (See page 179.)

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Century."

ARSENAL Varnish Co., 25th St. & Fourth Ave., Rock Island, Ill.

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Renew-O." (See page 177.)

BANNER—See Cortland Specialty Co.

BAUM'S Castorine Co., 104 N. George St., Rome, N. Y.

BAY STATE—See Wadsworth, Howland & Co.

BE-BE-Co.—See Boston Blacking Co.

BENOIT, Constant A., 12-14 Jerome Ave., Brooklyn, N. Y. "Permatex."

BILCHACO—See Billings-Chapin Co.

BILLINGS-CHAPIN Co., Cleveland, O. "Bilchaco," "Oughto."

BOSTON Blacking Co., (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

BRADLEY & Vrooman Co., 2629 Dearborn St., Chicago, Ill.

CENTURY—See Arnstein, Eugene.

CHEMICAL Spray Co., 74 Pearl St., Boston, Mass.

CHICAGO White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill. "King."

COLUMBUS Varnish Co., Columbus, O. "Peerless." (See page 209.)

CORTLAND Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Banner."

CUMMER Products Co., 2150 W. 15th St., Cleveland, O. "Perfect Auto Gloss."

DETROIT White Lead Works, 580-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

DIX Mfg. Co., Lewistown, Pa.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie." (See pages 189 to 192.)

EASYBRIGHT—See Stinson & Co.

EBERSON-LINDSLEY Paint Co., 19th & Morgan Sts., St. Louis, Mo. "Leather-Lac."

EVERNEW—See Felton, Sibley & Co.

FELTON, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa. "Evernew."

FLEXO—See Rodriguez, R. E.

FORDS—See Oriental Enamel Co.

GLAZENE—See New-Tone Mfg. Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker," "Quad-Lac." (See page 171.)

HAUTHAWAY & Sons, C. L., 846 Congress St., Boston, Mass.

HERCULES Chemical Works, 2128 W. Van Buren St., Chicago, Ill. "Non Such."

HIPPO—See Rodriguez, R. E.

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

JEWEL—See Wadsworth-Howland Co.

JEWELL Mfg. Co., 2863 22d St., Chicago, Ill. "Nelsons."

JOHNSTON Paint Co., R. F., Pearl & Main Sts., Cincinnati, O. "Leather Lac," "Top Fix."

KING—See Chicago White Lead & Oil Co.

LAWRENCE & Co., W. W., Pittsburg, Pa.

LEAKANOT—See National Rubber Co.

LEATH-R-NU—See Nu-Back Mfg. Co.

LEATHER-LAC—See Eberson-Lindsley Paint Co.

LEATHER LAC—See Johnston Paint Co.

LUCAS & Co., John, 822-30 Race St., Philadelphia, Pa.

McDOUGALL Varnish Co., 1317 Elk St., Buffalo, N. Y.

MANSFIELD Mfg. Corp., 822-28 S. Clinton St., Syracuse, N. Y.

MARTIN, L. G., 3923 Forbes St., Pittsburg, Pa.

MATT & Co., F., 491 Washington St., Newark, N. J. "Alcovie."

MECHEM, J. L., 113 E. Jackson St., Centerville, Ia.

MILLER Co., Frank, 849-51 W. 36th St., New York, N. Y.

MONTGOMERY-WASHBURN Co., Saugerties, N. Y.

MOUND City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

NATIONAL Rubber Co., 4409 Piqua St., St. Louis, Mo. "Leakanot."

NELSONS—See Jewell Mfg. Co.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill.

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PEERLESS AUTOMOBILE SPECIALTIES

MAKE OLD CARS LOOK LIKE NEW

Peerless Mohair Top Dressing
A dressing that dresses and waterproofs mohair, duck and canvas tops and curtains. Leaves the cloth soft and pliable, drying over night.
About one quart for a five-passenger car top.

Peerless Lining Dye.
Dies all linings a black uniform color over stains and faded parts alike. Dries in two hours.
About one quart for inside five-passenger top.

Peerless Leather Top Dressing
An oil preparation to keep rubber, leather and pantasote tops and curtains soft and pliable. Renews the finish. Dries in six hours.
About one quart for five-passenger top and curtains.

Peerless Ford Top Dressing.
An especially prepared dressing for Ford top material, making a rich black gloss finish, so that an old top will look like new. Dries hard over night. Wears indefinitely.
About one pint for a runabout top and one quart for touring car top.

Peerless Cushion Dressing.
Brightens and renews the finish on leather seats and cushions. Does not wash or rub off. Dries in thirty minutes.
About one pint for a small car; one quart for large car.

Peerless Lamp Enamel—Gloss.
A rich gloss finish for brass, nickel or iron. One coat covers solid. Air drying in ten to twelve hours.
About one pint for lamps of car.

Peerless Cylinder Enamel—Black
A rich, black gloss enamel that saves cylinders and all metal engine parts from rust. Not injured by heat, grease or gasoline. Air drying over night.
About one pint for a four cylinder engine.

Peerless Liquid Wax.
A wax polish for all varnished surfaces of automobiles. In liquid form so that it is easily applied in a light even coat. Polished with ease and ready for use at once. Does not collect dust, and is not injured by water.
About one pint to polish a large car.

18 Different Products for All Parts

A Different Product for Each Part

All Goods Sold at One Retail Price

One pint can $0.54	½ pint can $0.30
One quart can $1.04	⅛ gallon can $1.98
1 gallon can $3.75	

Dealers and Jobbers—Notice!
For your special convenience, we have listed our complete line of Peerless Specialties here in this book, so that at all times you will have our catalog before you with the dealer, garage, hardware store, and paint shop discount before you—33⅓% from list prices.
Notice our magazine and circular alvertising. For detailed literature, write us.

Peerless Mirror-oid
A varnish renewer. Applied with a brush or cloth to old varnished surfaces where the lustre has died out. Leaves a rich full gloss finish. Dries in 4 to 5 hours.
About one pint to one quart for an automobile.

Peerless Lamp Enamel—Dull.
A rich, dull finish for brass, nickel or iron. One coat covers solid. Air drying in five to six hours.
About one pint for lamps of car.

Peerless Cylinder Enamel—Gray
A rich gray gloss enamel that saves cylinders and all metal engine parts from rust. Not injured by heat, grease or gasoline. Air drying over night.
About one pint for a four cylinder engine.

Peerless Auto Body Polish.
A varnish food to brighten and renew the appearance of all varnished surfaces on an automobile Applied and polished ready for use in a few minutes.
About one pint to polish a car.

Peerless Jet Black Fender Japan.
A heavy bodied, rich, black, gloss enamel that covers solid with one coat. Looks like a baked job. Air drying in 24 to 36 hours.
About one quart for fenders of a car.

Peerless Anti-Rust Rim Paint.
A protective coating for automobile rims to keep them free from rust, and allowing the tires to be removed with ease. Dries in four to five hours.
About one pint for small car rims.

Peerless Extra Fine Black Japan.
A rich gloss, air drying enamel for all around use on wood or metal of automobiles. One coat covers solid and dries over night. Fine to touch up with.

Peerless Acid-Proof Battery Box Black.
An acid-proof coating for wood and metal that are brought in contact with acid and fumes from batteries. Keeps the acid from destroying wood and metal.

Peerless Shellac
A strictly high grade shellac for gaskets, cork carburetor floats, and such parts on an automobile. This is a high grade product cut in pure alcohol. Is not affected by gasoline.

THESE GOODS NOW USED BY OVER 8,000 AUTOMOBILE PAINTERS

The Columbus Varnish Co.

SOLE MAKERS COLUMBUS, OHIO

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DRESSING (Continued)

LEATHER DRESSING (Continued)

NEW-TONE Mfg. Co., 3336 Colorado Ave., Chicago, Ill. "Glazene."

NON SUCH—See Hercules Chemical Works.

NORTHWESTERN Chemical Co., Marietta, O. "Norwesco."
(See pages 172 and 173.)

NORWESCO—See Northwestern Chemical Co.

NOUVEAU—See Rodriguez, R. E.

NU-BACK Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Leath-R-Nu."

NUBIAN Paint & Varnish Co., 1856 Le Claire Ave., Chicago, Ill. "Victory."

ORIENTAL Enamel Co., 128 E. Ninth St., Los Angeles, Cal. "Fords."

OUGHTO—See Billings-Chapin Co.

PEERLESS—See Columbus Varnish Co.

PERCAMA—See Perkins Campbell Co.

PERFECT AUTO GLOSS—See Cummer Products Co.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Percama."
(See page 207.)

PERMATEX—See Benoit, Constant A.

PIONEER—See Northwestern Chemical Co.

QUAD-LAC—See Hall-Thompson Co.

RENEW-O—See Atlas Auto Supply Co.

REX—See Armiger Chemical Co.

RIE-NIE—See Durkee-Atwood Co.

RODRIGUEZ, R. E., 56-58 Warren St., New York, N. Y. "Nouveau," "Flexo," "Hippo."

ROGERS—See Detroit White Lead Works.

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y. "Rub-R-Tite.
(See page 285.)

RUB-R TITE—See Rub-On Mfg. Co.

ST. LOUIS Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo.

SCHLEGEL Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y.

SCHMOEGER, Frederic A., Sterling, Ill. "Sterling."

SLIKUP—See Arnold, N. B.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STERLING—See Schmoeger, Frederic A.

STINSON & Co., B. F., 418-28 Niagara St., Buffalo, N. Y. "Easybright."

THUMB, E. W., 872 Orleans St., Chicago, Ill.

TILCO Co., 814-20 S. Vandeventer Ave., St. Louis, Mo.

TOP FIX—See Johnston Paint Co.

U-SAV-YOUR Mfg. Co., 51 Perkins St., Warren, Mass.

UNO Mfg. Co., Royal Ins. Bldg., Chicago, Ill.

VAN Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

VICTORY—See Nubian Paint & Varnish Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WADSWORTH, Howland & Co., 84 Washington St., Boston, Mass. "Bay State."

WANG—See Van Tilburg Oil Co.

WEST Mfg. Co., 120-22 N. Madison St., Rockford, Ill.

WESTERN Reserve Varnish Co., 1251 Marquette Rd., Cleveland, O.

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

ZINSSER & Co., W., 195 William St., New York, N. Y.

MOHAIR TOP DRESSING

AMERICAN Chemical & Mfg. Co., Arcade Bldg., Norfolk, Va. "Hippo."

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "X-Ray."
(See page 177.)

BE-BE-CO.—See Boston Blacking Co.

BOSTON Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

BUCKEYE—See Van Tilburg Oil Co.

CARR Co., F. S., 31 Beach St., Boston, Mass. "Success."
(See page 165.)

COLUMBUS Varnish Co., Columbus, O. "Peerless."
(See page 209.)

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

EBERSON-LINDSLEY Paint Co., 19th & Morgan Sts., St. Louis, Mo.

EVERNEW—See Felton, Sibley & Co.

FELTON, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa. "Evernew."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker," Quad-Lac."
(See page 171.)

HIPPO—See American Chemical & Mfg. Co.

KNEUTOP—See Western Reserve Varnish Co.

LEATH-R-NU—See Nu-Back Mfg. Co.

LUCAS & Co., John, 322-30 Race St., Philadelphia, Pa.

McDOUGALL Varnish Co., 1317 Elk St., Buffalo, N. Y.

MANSFIELD Mfg. Corp., 322-28 S. Clinton St., Syracuse, N. Y.

MILLER Co., Frank, 349-51 W. 26th St., New York, N. Y.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill.

NORTHWESTERN Chemical Co., Marietta, O.
(See pages 172 and 173.)

NU-BACK Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Leath-R-Nu."

PEERLESS—See Columbus Varnish Co.

PERCAMA—See Perkins Campbell Co.

PERFECTITE—See Price Fire & Water Proofing Co.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Percama."
(See page 207.)

PRICE Fire & Water Proofing Co., 43 Union St., Poughkeepsie, N. Y. "Perfectite."

QUAD-LAC—See Hall-Thompson Co.

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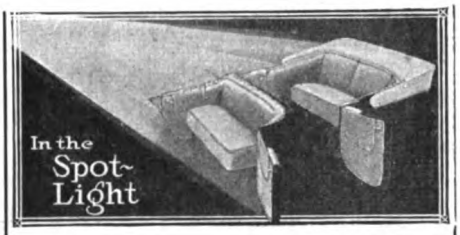
GREASE CUPS

Oilers, Hood Handles, Hood Catches, Floor Board Lifts, Metal Stampings, Castings, etc.

Grease Cups and Caps with Locking Devices.

Spring Bolt Caps in Brass and Steel, any finish desired.

The Burns & Bassick Co.
BRIDGEPORT, CONN.



WARNER AUTO UPHOLSTERY COVERS
FIT LIKE A GLOVE
DUST-PROOF WEAR-PROOF

Go where you will, you will find the spot light of popular approval centered on Warner Auto Upholstery Covers. From coast to coast and from Canada to the Gulf, the discriminating motorists are demanding them and the progressive dealers are selling them.

The covers are **tailor made** of the best materials, and guaranteed to fit **your** car—no matter what make or what year. Easily and quickly cleaned. On and off in a jiffy. They keep new cars looking new and restore the new look of old cars.

DEALERS:

Our price-lists, based on fair dealing for the consumer and the trade, get the business and give you a certain and a legitimate profit. Write today.

THE WARNER AUTO TOP COMPANY
1622-1626 Central Ave., CINCINNATI, OHIO
Established Thirty Years

For Rapid and Uniform Grinding of the most exacting kind

Use Mohawk

It contains no emery or carborundum—cutting is keen and accurate and highly polishes the surface. Made in 3 standard grades. Free samples to you if you will test it.

PRICES

1 lb. cans, any grade.....40c. per can
½ lb. cans, any grade.....25c. per can
¼ lb. cans, any grade.....15c. per can

Dealers write for discount

Mohawk Grinding Paste Mfg. Co.
ALBANY, N. Y.

Lennon
LIGHT PROTECTOR
PATENTED

is the greatest boon to motorists, inasmuch as it enables them to drive at night with the greatest degree of safety.

The LENNON is the only efficient light deflector on the market. It positively deflects the parallel rays to the ground without decreasing the amount of light or the efficiency of the parabolic reflector.

Simple, efficient and cheap—$1.00 per pair.

Every motorist wants a pair badly. Dealers write for discount.

LENNON MFG. CO.
Corner Watson and Main Streets
WILLIMANTIC, CONN.

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DRESSING (Continued)

MOHAIR TOP DRESSING (Continued)

RIE-NIE—See Durkee-Atwood Co.

SLIKUP—See Arnold, N. B.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

SUCCESS—See Carr Co.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang," "Buckeye."

WANG—See Van Tilburg Oil Co.

WESTERN Reserve Varnish Co., 1251 Marquette Rd., Cleveland, O. "Kneutop."

WONDER Worker—See Hall-Thompson Co.

X-RAY—See Atlas Auto Supply Co.

DRUMS

PRESSED STEEL BRAKE DRUMS

(For Cast Drums—See Castings)

AMERICAN Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.

BOSSERT Co., Utica, N. Y.
(See page 279.)

CROSBY Co., Buffalo, N. Y.
(See page 699.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

FEDERAL Pressed Steel Co., Milwaukee, Wis.
(See page 783.)

GIER Pressed Steel Co., Lansing, Mich.
(See page 787.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

HYDRAULIC Pressed Steel Co., 3180 E. 61st St., Cleveland, O.
(See pages 229 and 230.)

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

KELSEY Wheel Co., Detroit, Mich.
(See page 569.)

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

PRESSED Steel Tank Co., West Allis, Wis.

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

DUSTERS

MOTORISTS DUSTERS

(See Clothing, Motorists)

DYE

TOP LINING DYE

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Nu-Stain."
(See page 177.)

BE-BE-CO.—See Boston Blacking Co.

BOSTON Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

COL-R-OLE—See Rub-On Mfg. Co.

COLUMBUS Varnish Co., Columbus, O.
(See page 209.)

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

MANSFIELD Mfg. Corp., 822-28 S. Clinton St., Syracuse, N. Y.

NORTHWESTERN Chemical Co., Marietta, O. "Norwesco."
(See pages 172 and 173.)

NORWESCO—See Northwestern Chemical Co.

NU-BACK Mfg. Co., 114 N. Commercial St., St. Louis, Mo.

NU-STAIN—See Atlas Auto Supply Co.

RIE-NIE—See Durkee-Atwood Co.

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y. "Col-R-Ole."
(See page 285.)

SLIKUP—See Arnold, N. B.

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

DYNAMOMETERS

ELECTRIC TESTING DYNAMOMETERS

ALDEN, Geo. I., 48 Queen St., Worcester, Mass.

DIEHL Mfg. Co., Elizabethport, N. J.

SPRAGUE Electric Works, 527 W. 34th St., New York, N. Y.

HYDRAULIC TESTING DYNAMOMETERS

DETROIT—See Michigan Motor Specialties Co.

HERSCHELL-SPILLMAN Co., North Tonawanda, N. Y.
(See page 493.)

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Detroit."
(See page 671.)

STANDARD Motor Construction Co., 172-80 Whiton St., Jersey City, N. J.

DYNAMOS

BATTERY CHARGING DYNAMOS AND MOTOR GENERATORS

ALLIS-CHALMERS Mfg. Co., Milwaukee, Wis.

BURKE Electric Co., Erie, Pa.

CUSHMAN Electric Co., Dept. A., Concord, N. H.
(See page 213.)

Complete Index to Classification appears on Pages 8 to 27.

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We Specialize in Making

Stamped Sheet Metal Parts

TO ORDER

FOR AUTOMOBILES

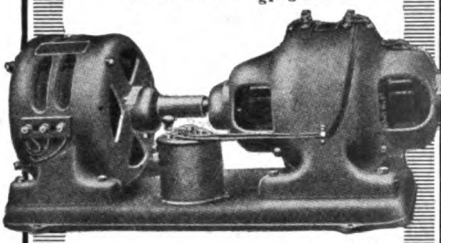
Worcester Pressed Steel Co.

Main Office and Factory

WORCESTER, MASSACHUSETTS

SERVICE plus PROFIT

with this Charging Set



This set is the most economical battery charging plant ever designed. Can be placed anywhere and requires no care or attention.

The generator is driven by either a D.C. or A.C. motor, single, two or three phase, direct connected.

We have built such instruments for 20 years and our experience and facilities make possible the low cost.

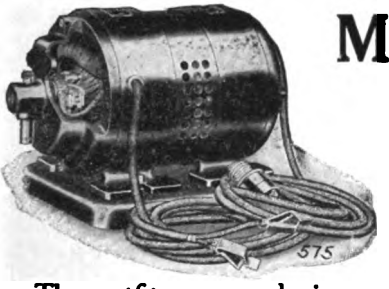
Send for our literature showing the detail of plant and wiring and a table of charging costs which will open your eyes to the profit there is in this branch of your business if properly handled.

Cushman Electric Company

Department A

Concord N. H.

Robbins & Myers Battery Charging Motor Generators



This outfit is made for charging batteries for automobiles, motor boats and other services, from an ordinary direct or alternating current lighting circuit.

The outfits are made in small sizes for private garages and in large sizes, which will charge several batteries at a time, for public garages.

To use the outfit all that is necessary is to attach the generator leads to the battery terminals with the clips and screw the motor plug into a lamp socket. The outfit regulates the charging rate and adjusts its polarity to the battery polarity, automatically. After the battery is charged the generator will float on the battery without injury.

Write for discounts to distributers and descriptive circular.

The ROBBINS & MYERS COMPANY, Springfield, O.

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DYNAMOS (Continued)

BATTERY CHARGING DYNAMOS AND MOTOR GENERATORS (Continued)

DIEHL Mfg. Co., Elizabethport, N. J.

FAIRBANKS, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

H-B—See Hobart Bros. Co.

HOBART Bros. Co., 113 Water St., Troy, O. "H-B."

HOLTZER-CABOT Electric Co., Roxbury, Mass.

KENDRICK & Davis Co., Lebanon, N. H.

KEWANEE Private Utilities Co., Kewanee, Ill.

LINCOLN Electric Co., 38th St. & Kelley Ave., N. E., Cleveland, O.

MAIN Electric Mfg. Co., 500-20 Aiken Ave., Pittsburgh, Pa.

MARTIN—See Northwestern Electric Co.

MENOMINEE Electric Mfg. Co., Menominee, Mich.

NORTHWESTERN Electric Co., 611-15 W. Adams St., Chicago, Ill. "Martin."

ROBBINS & Myers Co., Springfield, O. (See page 213.)

ROTH Bros. & Co., 1418 W. Adams St., Chicago, Ill.

SPRAGUE Electric Works, 527 W. 34th St., New York, N. Y.

WESTERN Electric Co., 463 West St., New York, N. Y. (See page 517.)

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

ELECTRIC LIGHTING AND BATTERY CHARGING DYNAMOS

ALLIS-CHALMERS Mfg. Co., Milwaukee, Wis.

APELCO—See Apple Electric Co.

APPLE Electric Co., Newark, N. J. "Apelco."

AUTO-LITER—See Electric Auto-Lite Co.

AUTO-SPARKER—See Motsinger Device Mfg. Co

AMERICAN Ever Ready Works, Long Island City, N. Y.

BEST-LITE Mfg. Co., Newton, Ia.

BIJUR Motor Lighting Co., 15th St. & River Front, Hoboken, N. J.

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

BRIGGS Magneto Co., Elkhart, Ind. "Maglite," "Nash."

CARLETON Co., 170 Summer St., Boston, Mass.

DAYTON Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."

DELCO—See Dayton Engineering Laboratories Co.

DYNETO Electric Co., Syracuse, N. Y. (See page 487.)

ECONOMY Electric Co., Economy, Pa. "Perfection."

ELECTRIC Auto-Lite Co., Toledo, O. "Auto-Liter." (See pages 215 to 218.)

ESTERLINE Co., 228 E. South St., Indianapolis, Ind.

EUREKA—See Henricks Magneto & Electric Co.

FEDERAL Devices Co., 1251 Michigan Ave., Chicago, Ill.

FISHER Electrical Works, 32 Lynn St., Detroit, Mich.

GRAY & Davis, Boston, Mass. (See pages 483 to 486.)

HEINZE Co., John O., Springfield, O. (See page 487.)

HENRICKS Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind. "Eureka." (See page 651.)

HERTNER Electric & Mfg. Co., 430 Prospect Ave., N. W., Cleveland, O.

HOLTZER-CABOT Electric Co., Roxbury, Mass.

HUFF—See Simms Magneto Co.

KEMCO Electric Mfg. Co., 2229 Ashland Rd., Cleveland, O.

L-N—See Leece-Neville Co.

LEECE-NEVILLE Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

LEONARD Electric Co., Ward, Mt. Vernon, N. Y.

MAGLITE—See Briggs Magneto Co.

MAXIMUM Electrical Co., 264-68 Jefferson Ave., E., Detroit, Mich.

MOTSINGER Device Mfg. Co., Lafayette, Ind. "Auto-Sparker."

NASH—See Briggs Magneto Co.

NATIONAL Coil Co., Lansing, Mich.

NORTH East Electric Co., Rochester, N. Y. (See page 487.)

PERFECTION—See Economy Electric Co.

REMY Electric Co., Anderson, Ind. (See page 733.)

SIMMS Magneto Co., East Orange, N. J. "Huff." (See page 627.)

SPLITDORF Electrical Co., Newark, N. J.

TECO—See Tritt Electric Co.

TRITT Electric Co., Union City, Ind. "Teco."

VERLUX Co., Alliance, O.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

WAGNER Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

IGNITION DYNAMOS

(See Magnetos, Ignition)

ECONOMIZERS

FUEL ECONOMIZERS

(See Mixers or Agitators, Fuel)

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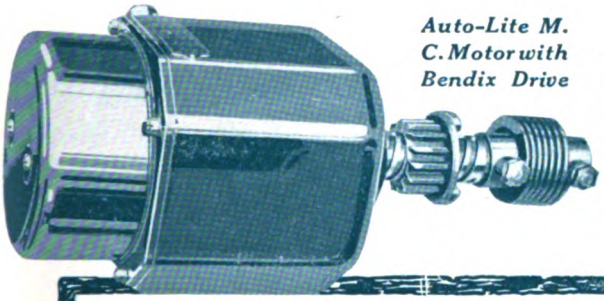
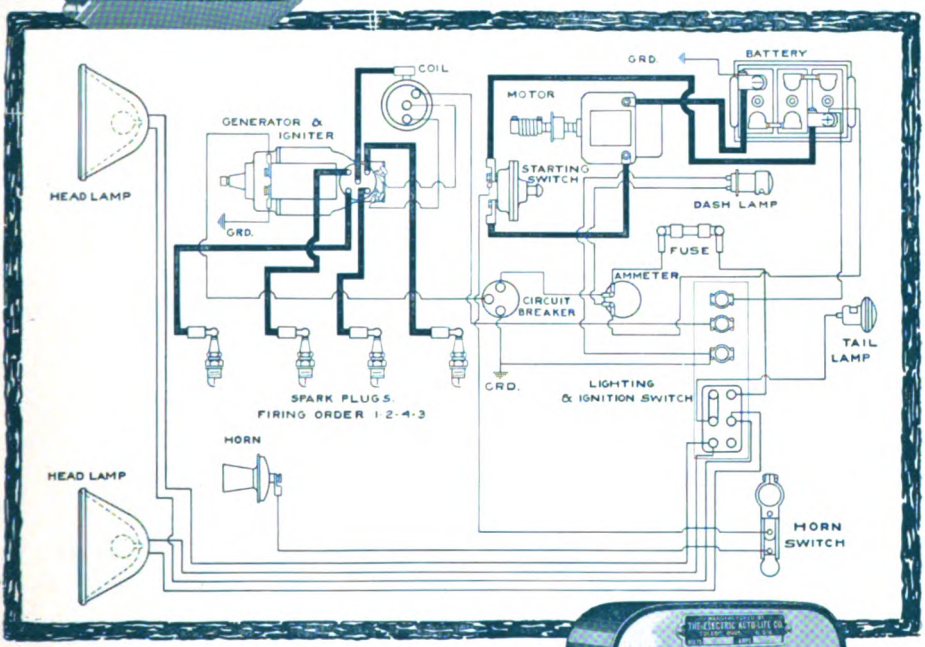
Auto-Lite Electric STARTING & LIGHTING System



Auto-Lite M. C. Motor with Bendix Drive

No mechanical or electrical device ever has been invented or manufactured which will not at some time require attention or some slight adjustment. The better the electrical system, the fewer the troubles experienced.

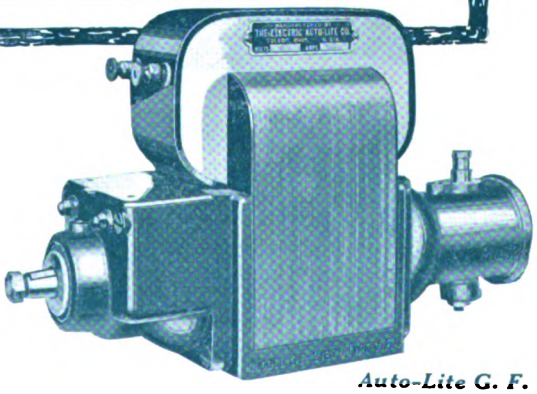


With the utmost confidence that the *Auto-Lite Electric Starting and Lighting System* is at once the simplest and most efficient plant of its kind ever produced—but bearing in mind the lack of knowledge on the part of the average motorist as to the care of electrical apparatus—we would make the following suggestions:

In case of difficulty with the electrical equipment, try to locate the particular part that is giving the trouble before sending in a complaint.

Carefully test such parts as are suspected of giving trouble. This will save you both time and money. Our experience shows that troubles are often blamed on one part when some other part is at fault.

Our Instruction Booklet giving detailed direction for the proper care of the system will be sent upon request.



Auto-Lite G. F. Generator

We Sell to the Manufacturer Only

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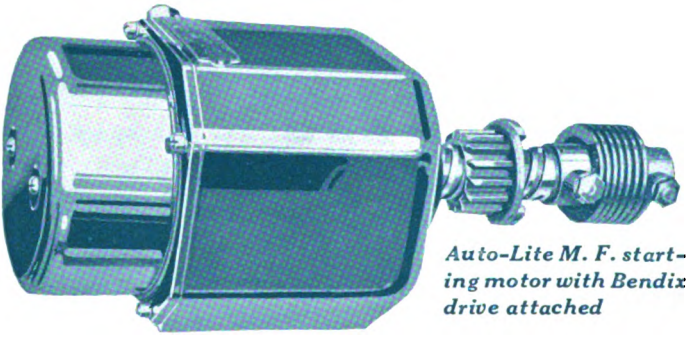
Some Impressive



Auto-Lite M. F. starting motor with Bendix drive attached

The Auto-Lite System was the first six-volt system ever adopted as standard equipment on an automobile. It allows a small battery of minimum weight.

It turns the engine over **every** time with a minimum of current consumption.

It gives a constant, steady stream of white light at the turn of a button—always dependable—always on tap.

At any car speed of over six miles per hour it is storing up current in your battery.

Generator reaches maximum production at car speed of about eighteen miles per hour.

Electric Auto-Lite
STARTING – LIGHTING – IGNITION

Efficiency of system is very high.

Entire system is so carefully constructed that parts are absolutely interchangeable on like models.

Extreme simplicity of design—the result of hundreds of experiments—allows elimination of many small and delicate parts.

System has no complicated and delicate controls such as mercury switches, rheostats, relays, carbon contacts, etc.

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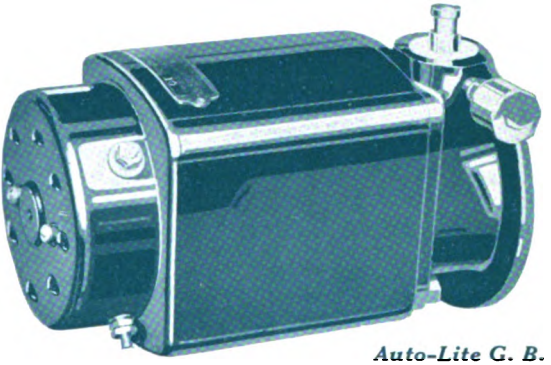
Auto-Lite Points

Entire operation absolutely automatic and self-governing, requiring no attention from the owner.

Two-unit system gives more flexibility, greater ease of installation and perfect accessibility.



Auto-Lite G. B. generator. Maximum capacity 14 amperes

Over 5800 consecutive starts, exhausting three batteries, were made by a large automobile manufacturer without one miss—more starts in three days than the average owner would make in a year.

Our system of keeping repair parts enables you to secure any part for a machine at a moment's notice at our factory.

Electric Auto-Lite
STARTING - LIGHTING - IGNITION

Absolutely positive action is assured—when you put your foot on the starting button the Auto-Lite motor cranks your engine and at a speed of over 100 revolutions per minute, no matter what the temperature. The power is there.

The system is **right** from start to finish—well designed—well built—well known—well liked.

Every system absolutely guaranteed to give perfect service for one year from date of installation.

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Complete List of Auto-Lite Service Stations

Special Factory Representatives

244 West 49th St., New York City.
1475 Bush St., San Francisco, Calif.
1527 Grand Ave., Kansas City, Mo.

Other Special Service Stations as Follows:

Auto Ignition & Speedometer Co.	1105 First Ave.	Spokane, Wash.
Auto-Lite Service Co.	425 N. Capital Ave.	Indianapolis, Ind.
Auto Electric Service Co.	687 Woodward Ave.	Detroit, Mich.
Auto Electric Service Co.	2509 Broadway	Oakland, Cal.
Auto Electrical Supply Co	265 N. 4th St.	Columbus, Ohio
Bernhard & Turner	506 W. 7th St.	Des Moines, Iowa
Boyle Engineering Co.	224 E. 7th St.	Cincinnati, Ohio
J. C. Duncan, Jr., Co.	132 S. 24th St.	Philadelphia, Pa.
P. J. Durham Co	244 West 49th St.	New York, N. Y.
Electric Garage	200 East Gray St.	Elmira, N. Y.
Electric Service Co.	825 Broadway	Denver, Col.
Electric Auto-Lite Service Co.	2934 Nicollet Ave.	Minneapolis, Minn.
Electric Products Co.	1527 Grand Ave.	Kansas City, Mo.
Electric Auto-Lite Service Station	1241 Michigan Ave.	Chicago, Ill.
Fehr Bros.	172 Bleury St.	Montreal, Que.
Wm. H. Flaherty Co.	1105 A Commonwealth Ave.	Boston, Mass.
Garrett's Garage		Charlotte, N. C.
Gibson Electric Co.	Alder at Twelfth St.	Portland, Ore.
Goodin Motor & Truck Co.	328 S. Market St.	Wichita, Kan.
Guarantee Ignition & Battery Co.	32 E. Miner Ave.	Stockton, Cal.
S. G. Hoffman Co.	3927 Olive St.	St. Louis, Mo.
Houston Storage Battery Co	1111 Main St.	Houston, Texas
A. B. Johnson	114 Brady St.	Davenport, Iowa
J. E. Kockhan	49 Peck St.	Providence, R. I.
L. C. R. Storage Battery Co.	122 N. St. Clair St.	Dayton, Ohio
McKelvey-Ewing Electrical Co	Market & Tenth Sts.	Wheeling, W. Va.
Meinhard Auto Service Co.	846 Main St.	Buffalo, N. Y.
Monroe Battery Co.		Cedar Rapids, Iowa
Motor Service Co.		Pierpont, N. D.
L. T. Prunty	427 W. Main St.	Oklahoma City, Okla.
Penn Storage Battery Co.	5986 Center Ave.	Pittsburg, Pa.
Reliance Electric Co.		Richmond, Va.
Reliance Electric Co.		Norfolk, Va.
Rhodes Ignition Co.	611 Pike St.	Seattle, Wash.
Chas. Rubel Co.	1312 14th St., N. W.	Washington, D. C.
Richardson's Garage	1802 Morton St.	Baltimore, Md.
J. Stanley-LaSha	4th St.	San Diego, Cal
Strahle & Anderson	2059 Farnam St.	Omaha, Nebr.
Strahle & Anderson	317 So. 11th St.	Lincoln, Nebr.
Strahle & Anderson		Sioux City, Iowa
Western Auto Electric Co.	306 W. Pice St.	Los Angeles, Cal.
Williams, E. Q.	537 S. Clinton St.	Syracuse, N. Y.
Zimmerman Motor Car Co.	Walnut & Linden Sts.	Harrisburg, Pa.

The Electric Auto-Lite Company

Toledo, Ohio, U. S. A.

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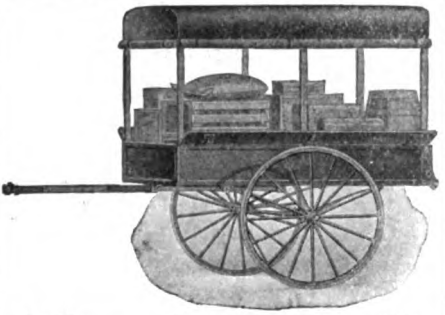
Gear Cutting Alloy and Iron Pistons

We are the Pioneers in this line and have the best equipped Shop in the Northwest for this line of work

WE ALSO BUILD "The CAPITOL" MARINE MOTORS

Auto Engine Works

St. Paul Minnesota



The Autotrail

will solve your hauling problem. Your car will then pay for itself and become an "asset" instead of a "liability" to your business.

Automobile Dealers: Attention!

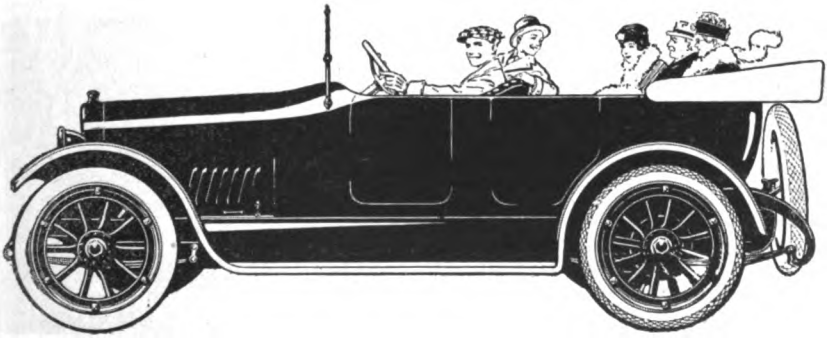
Do you know that trailers are now being shipped to some dealers in carload lots? A new field of profit is open for you. Now is the time to get in on the ground floor and take advantage of the rapidly growing demand for trailers. Write today for full particulars and catalog of the Autotrail. Mention your territory.

Lion Buggy Company

Dept. T. D. Cincinnati, O.

Also manufacturers of detachable Limousine and Coupe tops for Fords and other cars.

SUN "Light Six" $1095 F.O.B. Elkhart Ind.



5 passenger touring car—4 passenger Roadster—5 passenger Sedan
50 H. P. Motor, 34 x 4 Tires, 116 inch wheelbase.

Write for illustrated catalog.

SUN MOTOR CAR CO., Inc.

Elkhart, Ind.

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EJECTORS

STEAM EJECTORS

(For filling tanks on steam cars)

PENBERTHY Injector Co., Detroit, Mich. (See page 137.)

ELBOWS

PIPE ELBOWS

(See Fittings, Pipe)

ELECTROLYTE

STORAGE BATTERY ELECTROLYTE

CONTACT Process Co., Abbott Rd., Buffalo, N. Y.

GRASSELLI Chemical Co., 80 Maiden Lane, New York, N. Y.

KALBFLEISCH Co., Franklin H., Broadway & 16th St., New York, N. Y. (See page 681.)

ENAMELS

AUTOMOBILE ENAMELS

(See Paints, Enamel)

BRASS ENAMELS, LACQUERS AND FINISHES

(For blackening lamps, radiators and other brass work on car—See also Paints, Enamel; also Lacquers, Metal)

ARGENAMEL Chemical Co., Smead & Bancroft Sts., Toledo, O.

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup." (See page 179.)

ARSENAL Varnish Co., 25th St. & Fourth Ave., Rock Island, Ill.

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Metal-Lac," "Blac-Namel." (See page 177.)

BENOIT, Constant A., 12-14 Jerome Ave., Brooklyn, N. Y. "Permatex."

BLAC-NAMEL—See Atlas Auto Supply Co.

BRADLEY & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "C. Q. P."

BRASS-KOTE—See Northwestern Chemical Co.

C. Q. P.—See Bradley & Vrooman Co.

CHICAGO Varnish Co., 2100 Elston Ave., Chicago, Ill.

COLUMBUS Varnish Co., Columbus, O. "Peerless." (See page 209.)

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie." (See pages 189 to 192.)

GUN Metal Finish Co., Main & Water Sts., Decatur, Ill.

HALL-THOMPSON Co., Hartford, Conn. "Jet-Lac." (See page 171.)

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

JET-LAC—See Hall-Thompson Co.

JEWEL—See Wadsworth-Howland Co.

LEATH-R-NU—See Nu-Back Mfg. Co.

METAL-LAC—See Atlas Auto Supply Co.

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill.

NORTHWESTERN Chemical Co., Marietta, O. "Brass-Kote." (See pages 172 and 173.)

NU-BACK Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Leath-R-Nu."

PEERLESS—See Columbus Varnish Co.

PERMATEX—See Benoit, Constant A.

RIE-NIE—See Durkee-Atwood Co.

RODRIGUEZ, R. E., 56-58 Warren St., New York, N. Y.

ROGERS—See Detroit White Lead Works.

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y. (See pages 285.)

SCHLEGEL Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y.

SCHMOEGER, Frederic A., Sterling, Ill. "Stay-Shiny."

SINER Paint Co., Philadelphia, Pa.

SLIKUP—See Arnold, N. B.

SONNEBORN Sons, L., 262 Pearl St., New York, N. Y. "3 Star."

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STAY-BRIGHT Lacquer Co., 58 W. Washington St., Chicago, Ill.

STAY-SHINY—See Schmoeger, Frederic A.

3-STAR—See Sonneborn Sons.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WADSWORTH, Howland & Co., 34 Washington St., Boston, Mass.

WANG—See Van Tilburg Oil Co.

WHIZ—See Hollingshead Co.

ENGINES

GASOLINE ENGINES

(See Motors, Gasoline)

KEROSENE ENGINES

(See Motors, Kerosene)

STEAM AUTOMOBILE ENGINES

OFELDT & Sons, F. W., Nyack, N. Y.

Complete Index to Classification appears on Pages 8 to 27.

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YORK, PA. U.S.A.

The "BELL" Model 16 Touring Cars and Roadsters

Light 4, 30 H. P. 112 inch wheel base, 4 inch tires, genuine leather upholstering, silk mohair "One Man" top, full floating axle, spiral bevel differential gears, high grade lighting and starting system, roomy stream line body designed by Engineer world-wide experienced. Manufactured by well organized and financed company, most high grade, popular priced car in America. Liberal proposition for live agents—do not wait, write now.

BELL MOTOR CAR COMPANY
York, Pa. U. S. A.

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THE SPECIALIZED TRUCK

3/4 to 1-Ton CAPACITY ONLY

Six-Cylinder Continental Motor

TRUCK COMPLETE NOW

$1085

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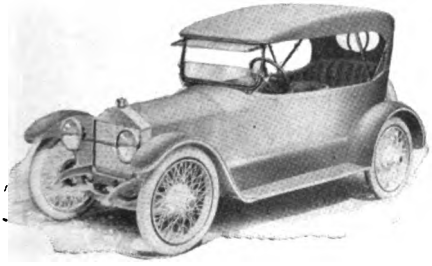
Address, Globe Truck Dept.
The Globe Furniture Co.
NORTHVILLE, MICH.

Live Dealers should see the

ROAMER



Now being referred to as the most beautiful light six in America. Appeals instantly to discriminating buyers who will be willing to pay you a long profit to secure this distinctive car of European design. finished to their own specifications.

And

The New Halladay Sixes

are also ready sellers anywhere.

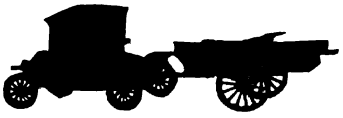
Ask us to submit details and our liberal agency proposition.

BARLEY MFG. CO.
STREATOR, ILL.

JACKSON
AUTO TRAILERS

Make money for dealers. Easily sold because of quality construction, superior finish and low prices.

Every car owner is a prospect.



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"We are pleased to say that the Jackson trailer bought from you last fall is giving us perfect satisfaction.
"AUGUSTA LUMBER CO.,
"Augusta, Ga."

Ask for new catalog.

The Miles Manufacturing Co.
302 Franklin St., Jackson, Mich.

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AUTOMOBILE FIRE EXTINGUISHERS

(For Car Equipment)

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ELECTRENE Co., 17 Battery Pl., New York, N. Y.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y.

LA MAY Mfg. Co., 80 N. Water St., Rochester, N. Y.

PHOENIX—See Rex-Harris Fire Appliance Co. of N. Y.

PYRENE Mfg. Co., 1358 Broadway, New York, N. Y.

RELIABLE—See Durkee & Co.

REX-HARRIS Fire Appliance Co. of N. Y., 36 E. 23d St., New York, N. Y. "Phoenix."

EYES

SCREW EYES

(See Screw Eyes)

FABRIC

COTTON TIRE FABRIC

BOSTON Yarn Co., Boston, Mass.

BRANDER & Curry, 30 E. 42d St., New York, N. Y.

BRIGHTON Mills, Passaic, N. J.

CALDWELL Co., R. J., 15 Park Row, New York, N. Y.

CATLIN & Co., 345 Broadway, New York, N. Y.

CONNECTICUT Mills Co., Danielson, Conn.

MANHASSET Mfg. Co., Turks Head Bldg., Providence, R. I.

SEARS & Co., Wellington, 93 Franklin St., Boston, Mass.

TAYLOR, Armitage & Co., 346 Broadway, New York, N. Y.

TURNER Co., J. Spencer, 86 Worth St., New York, N. Y.

FANS

RADIATOR FANS

(See also Radiators)

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

HARDY Mfg. Co., Pendleton, Ind. (See page 223.)

HOTZ Foundry & Mfg. Co., Fremont, O.

HUNT & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

McCORD Mfg. Co., Detroit, Mich. (See pages 418 and 419.)

OAKES Co., Dept. A., Indianapolis, Ind. (See page 223.)

PITTER Fan Co., 1842 Peoples Gas Bldg., Chicago, Ill. (See page 273.)

SPARKS-WITHINGTON Co., Jackson, Mich.

TRIO Mfg. Co., 1192-1206 Bellevue Ave., Detroit, Mich.

FASTENERS

CURTAIN FASTENERS

ACME—See Scovill Mfg. Co.

ANCHOR—See North & Judd Mfg. Co.

ANDERSON Electric Machine Tool Co., 1113 Cass Ave., St. Louis, Mo.

BOSTON Fastener Co., 144-46 W. 37th St., New York, N. Y.

BREWSTER—See Cowles & Co.

CARR Fastener Co., 31 Ames St., Cambridge, Mass.

COWLES & Co., C., New Haven, Conn. "Brewster," "Excelsior," "Ideal," "Perfect," "Success." (See page 257.)

CRANDAL, Stone & Co., Binghamton, N. Y. "Pioneer," "Premier," "Presto." (See page 469.)

DESOCO—See Detroit Socket Co.

DETROIT Socket Co., 314 Jefferson Ave., W., Detroit, Mich. "Desoco."

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

EXCELSIOR—See Cowles & Co.

IDEAL—See Cowles & Co.

JONAH & George, Merrimac, Mass.

KENTUCKY—See Neider Co.

LEADER—See Neider Co.

METAL Stamping Co., 13th St. & Boulevard Long Island City, N. Y.

MURPHY Co., G. W. J., Merrimac, Mass.

NEIDER Co., F. A., Augusta, Ky. "Peerless," "Leader," "Kentucky."

NORTH & Judd Mfg. Co., New Britain, Conn. "Perfection," "Anchor." (See page 835.)

NOVELTY Mfg. Co., 125 Maple St., Waterbury, Conn.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

PEERLESS—See Neider Co.

PERFECT—See Cowles & Co.

PERFECTION—See North & Judd Mfg. Co.

PIONEER—See Crandal, Stone & Co.

PREMIER—See Crandal, Stone & Co.

PRESTO—See Crandal, Stone & Co.

RELIABLE—See Smith & Co.

ROEHM & Davison, Woodbridge & Wayne Sts., Detroit, Mich.

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Any diameter—either right or left hand rotation.

Experience and large production gives you better fans at lower prices.

Recommendations and quotations promptly made.

Send blue prints of present fan layout if possible.

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Indianapolis, Ind.
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FANS

The Hardy Radiator Fan

is a fan of high quality and efficiency. Our special attention is given to the design and manufacturing of radiator fans of the very highest efficiency and quality at a very low cost. Send us your blue print or size of motor and let us prove to you our price and goods are right.

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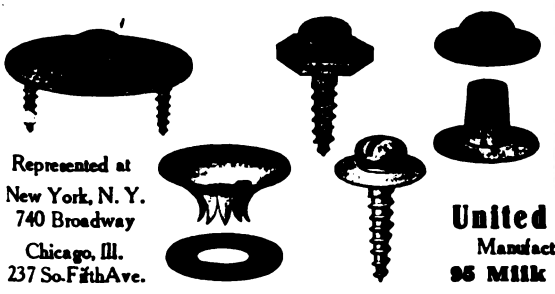
Push Button Switches. Electric Cigar Lighters. Dome, Step and Corner Lights. Morocco and Hard Wood Toilet Cases. Door and Grab Handles. O'Brien Window Locks and Anti-Rattlers. Limousine Fittings. Brass, Aluminum and Steel Mouldings. Watch Holders. Foot Rests. Robe Rails. Bow Separators. Fore Door, Limousine and Landauletto Ventilators. Lace Plates. Brass and Celluloid Lever-lock Handles. Hinges. Buckles. Footman Loops and Fasteners. Limousine Arm Slings. Electric Annunciators, Electric, Squawker and Whistle Speaking Tubes. Anti-rattling Door Bumpers and Dove-tails.

CONTRACT WORK A SPECIALTY.

JOSEPH F. O'BRIEN MFG. CO.
63 PARK PLACE NEW YORK CITY

FASTENERS



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Of Every Size and Style. Used on all the Leading Cars. Prompt Deliveries in any Quantity. Write for Prices.

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Manufacturers of Snap Fasteners and Metal Goods
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FASTENERS (Continued)

CURTAIN FASTENERS (Continued)

SCHERER & Co., H., Detroit, Mich.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill. "Acme."
(See page 255.)

SMITH & Co., Jos. N., Detroit, Mich. "Reliable."
(See page 227.)

STRONG Co., M. H., 168 South Ave., Rochester, N. Y.

SUCCESS—See Cowles & Co.

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y.

UNITED States Fastener Co., 95 Milk St., Boston, Mass.
(See page 223.)

WILCOX, Crittenden & Co., 33 Main St., Middletown, Conn.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

HOOD FASTENERS

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BURNS & Bassick Co., Bridgeport, Conn.
(See page 211.)

BUSH Mfg. Co., Hartford, Conn.
(See page 467.)

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

EVERTIGHT—See Gemco Mfg. Co.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Evertight."
(See page 127.)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

MEDINA Stamping & Machine Co., 317 Main St., Medina, N. Y.

SARGEANT Mfg. Co., New & Summit Sts., Newark, N. J.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

TIRE CHAIN FASTENERS

FAUS, Jr., Jacob, 413 Spruce St., Boulder, Colo.

FENDERS

AUTOMOBILE FENDERS

AUTO Safety Fender Co., 200 Wood St., Pittsburgh, Pa. "Royer."

HERO Mfg. Co., Gaul & Adams Sts., Philadelphia, Pa.

ROYER—See Auto Safety Fender Co.

STANDARD Fender Co., 333 S. Clinton St., Chicago, Ill.

TELESCOPE Fender Co., Cleveland, O.

MUD FENDERS

(See Guards, Mud)

FIBRE

HARD FIBRE

(Sheet, Rod and Tube)

AMERICAN Vulcanized Fibre Co., 585-95 Equitable Bldg., Wilmington, Del.
(See page 225.)

CONTINENTAL Fibre Co., Newark, Del.
(See page 171.)

DELAWARE Hard Fibre Co., Wilmington, Del.

DIAMOND State Fibre Co., Elsmere, Del. "Disfico."

DISFICO—See Diamond State Fibre Co.

EMPIRE Mfg. Co., 26th & Tatnall Sts., Wilmington, Del.

KEYSTONE Fibre Co., Yorklyn, Del.

NATIONAL Fibre & Insulation Co., Wilmington, Del.

SPAULDING & Sons Co., J., Wheeler St., Tonawanda, N. Y.

STANDARD Fibre Co., 11-15 Miller St., Somerville, Mass.

WILMINGTON Fibre Specialty Co., Wilmington, Del.
(See page 225.)

FILLERS

PAINT FILLERS

ACME White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

BERRY Bros., Detroit, Mich. "Lionoil."

BRADLEY & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "C. Q. P."

BRIDGEPORT Wood Finishing Co., New Milford, Conn. "Wheelers."

C. Q. P.—See Bradley & Vrooman Co.

CAPITOL CITY—See Indianapolis Paint & Color Co.

CELOX—See Valentine & Co.

CHASE, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y.

CHICAGO Varnish Co., 2100 Elston Ave., Chicago, Ill. "Chi-Var-Co."

Complete Index to Classification appears on Pages 8 to 27.

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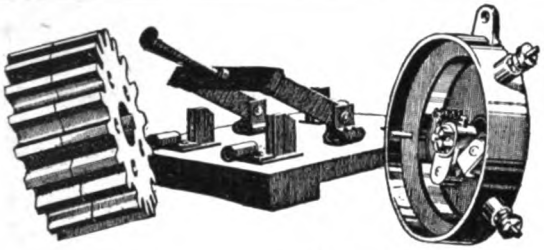

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VUL-COT Fibre is an infallible insulator.
It also makes noiseless and practically wearless gears.
Excellent for starting-motor pinions. Quiet, efficient and absolutely dependable.
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We will gladly assist automobile engineers and dealers in their researches involving the possible use of vulcanized fibre.

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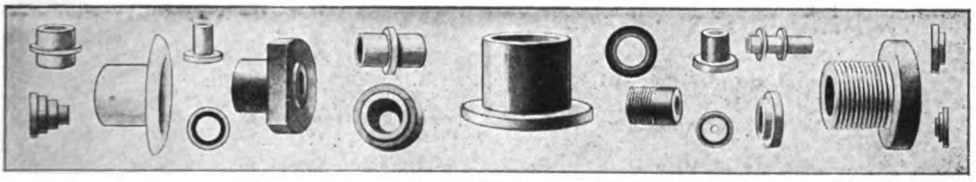
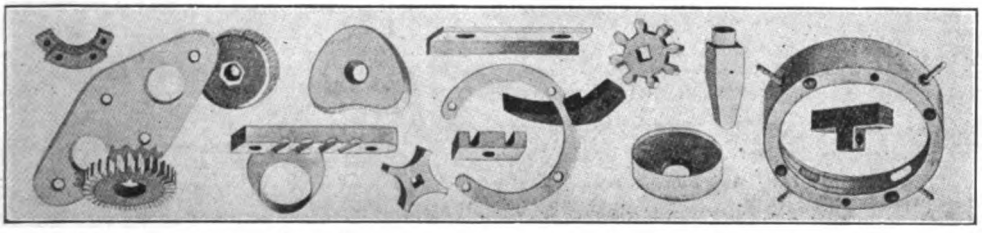


WILMINGTON FIBRE



You save money and get better results by substituting fibre for paper, cardboard, wood, bone, ivory, glass, porcelain, iron, brass, copper, leather, rubber, composition and other substances.
Fibre insulates. It works easily. It is not brittle and has qualities of its own which cannot be duplicated.
If you *can* use fibre you *should* use it. A request to us will tell you how and why it has over a million uses. In sheets, tubes, rods, black, red or gray.
Anything in fibre, in any quantity, on short notice.

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WILMINGTON, DEL.

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FILLERS (Continued)

PAINT FILLERS (Continued)

CHI-VAR-CO.—See Chicago Varnish Co.

CINCINNATI Color Co., Eighth & Evans Sts., Cincinnati, O.

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

DITZLER Color Co., 18 W. Baltimore Ave., Detroit, Mich.

ESCO—See Smith & Co.

FLINT Varnish & Color Works, Flint, Mich.

FLOOD & Conklin Co., 136 Chestnut St., Newark, N. J.

FOREST City Paint & Varnish Co., 3884 Lakeside Ave., Cleveland, O.

GRAVES Co., N. Z., 22-26 S. Third St., Philadelphia, Pa.

HARDY Paint & Varnish Co., Toledo, O.

HILDRETH Varnish Co., 90 West St., New York, N. Y.

HILO—See Moller & Schumann Co.

INDIANAPOLIS Paint & Color Co., 118 W. Chesapeake St., Indianapolis, Ind. "Capitol City."

JOHNSTON Paint Co., R. F., Pearl & Main Sts., Cincinnati, O. "Krakno."

KEYSTONE Paint & Filler Co., Muncy, Pa

KRAKNO—See Johnston Paint Co

LIONOIL—See Berry Bros.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

MOLLER & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y. "Hilo."

MOSER Co., Chas., Cincinnati, O.

MOUND City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

MURPHY Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.

NICE, Eugene E., 272 S. Second St., Philadelphia, Pa.

PHOENIX Paint & Varnish Co., 124 Market St., Philadelphia, Pa.

RENO Bros. Paint Co., Pulaski, Pa.

ROGERS—See Detroit White Lead Works.

ST. LOUIS Surfacer & Paint Co., Arlington Ave. & Terminal Belt Line, St. Louis, Mo.

SCHRACK & Co., 152 N. Fourth St., Philadelphia, Pa.

SMITH & Co., Edward, Sixth St. & West Ave., Long Island City, N. Y. "Esco."

VALENTINE & Co., 456 Fourth Ave., New York, N. Y. "Celox."

VESTAL Paint Co., Vestal, N. Y.

WHEELERS—See Bridgeport Wood Finishing Co.

WILHELM Co., A., Third & Bern Sts., Reading, Pa.

FINS

RADIATOR FINS

(See Discs, Radiator)

FITTINGS

PIPE FITTINGS

(For Tubing or Brazing Fittings—See Tubing Unions)

BARD Union Co., Norwich, Conn.

BARRETT Mfg. Co., James, 117 Pearl St., Boston, Mass.

BELFIELD Co., H., 435 N. Broad St., Philadelphia, Pa.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CRANE Co., 836 S. Michigan Ave., Chicago, Ill.

DALTON-INGERSOLL Mfg. Co., 171-75 High St., Boston, Mass.

HAMLIN & Emery Brass Co., 49 Island St., Boston, Mass.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

JARECKI Mfg. Co., 149 E. Ninth St., Erie, Pa.

KELLY & Jones Co., Greensburg, Pa.

KINSEY & Mahler Co., 400 S. Adams St., Peoria, Ill.

LAVIGNE Mfg. Co., 625-41 Commonwealth Ave., Detroit, Mich.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

McDONALD Mfg. Co., A. Y., Dubuque, Ia.

McNAB & Harlin Mfg. Co., 55 John St., New York, N. Y.

McRAE & Roberts Co., 221-35 Campbell Ave., Detroit, Mich.

MICHIGAN Lubricator Co., 661-73 Beaubien St., Detroit, Mich.

PITTSBURG Valve & Fittings Co., Barberton, O.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

POWHATAN Brass & Iron Works, Ranson, W. Va.

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

RICHARDSON-PHENIX Co., 122-28 Reservoir Ave., Milwaukee, Wis. "Union Cinch."

RUNDLE-SPENCE Mfg. Co., 67 Second St., Milwaukee, Wis.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

STODDARD Union Co., Grand St., Lockport, N. Y.

UNION CINCH—See Richardson-Phenix Co.

WALWORTH Mfg. Co., Boston, Mass.

WARE Coupling & Nipple Co., Ware, Mass.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

TOP FITTINGS AND FIXTURES

(See also Bows, Top; also Fasteners, Curtain; also Irons, Slat; also Irons, Top; also Rests, Bow; also Separators, Bow; also Sockets, Bow; also Straps, Top)

AMESBURY Brass & Foundry Co., Amesbury, Mass.

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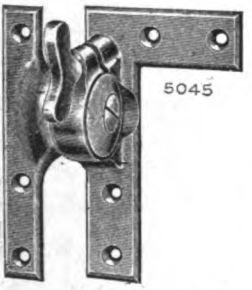

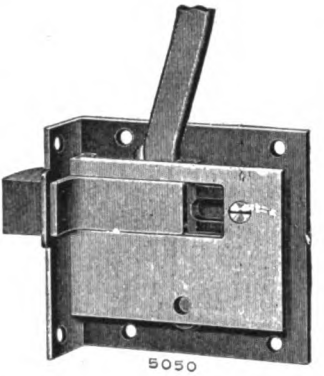

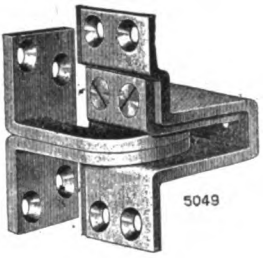

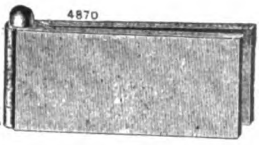

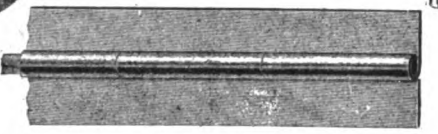

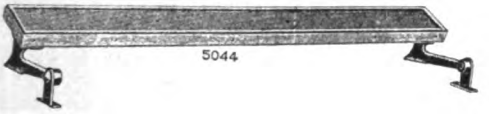

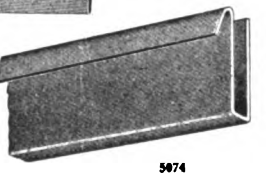

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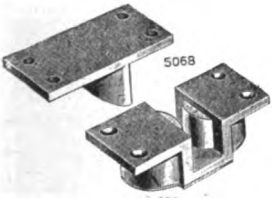

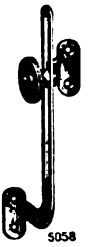

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are indicative of what you will find throughout the pages of our catalog. If you want high quality at a moderate price. Send for it.

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DETROIT, MICH.

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Cut full size

5021
Cut full size

4933
Cut ½ size

4934
Cut ½ size

No 4

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FITTINGS (Continued)

TOP FITTINGS AND FIXTURES (Continued)

CORTLAND Carriage Goods Co., 115 Pt. Watson St., Cortland, N. Y.

CORTLAND Forging Co., Cleveland St., Cortland, N. Y.

DOUGLAS & Lomason Co., Detroit, Mich.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

METAL Stamping Co., 18th St. & Boulevard, Long Island City, N. Y.

MONARCH Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

SCHERER & Co., H., Detroit, Mich.

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

FLAGS

FLAGS, PENNANTS AND EMBLEMS

AMERICAN Pennant Co., 69-71 Greene St., New York, N. Y.

BLOOM Bros. Co., 422-30 First Ave., N., Minneapolis, Minn.

CHICAGO Pennant Co., 1224 E. 63d St., Chicago, Ill.

KOSMOS-ART Co., 120 E. Sixth St., Cincinnati, O.

LUXEMOOR Co., 114 E. 13th St., New York, N. Y.

MASSARI Co., H. W., 209 S. State St., Chicago, Ill.

MEILER & Sons, J. B., Dayton, O.

ORCUTT & Co., J. C., 184 S. 13th St., Lincoln, Neb.

STAATS & Co., E. G., Mt. Pleasant, Ia.

FLANGES

PRESSED STEEL HUB FLANGES

(For Forged or Cast Flanges—See Forgings; also Castings)

BOSSERT Co., Utica, N. Y.
(See page 279.)

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

CROSBY Co., Buffalo, N. Y.
(See page 699.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

FEDERAL Pressed Steel Co., Milwaukee, Wis.
(See page 783.)

GIER Pressed Steel Co., Lansing, Mich.
(See page 787.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

KELSEY Wheel Co., Detroit, Mich.
(See page 569.)

KONIGSLOW Mfg. Co., Otto, E. 35th St., & Perkins Ave., Cleveland, O.

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

FLOATS

CORK FLOATS

ARMSTRONG Cork Co., 124 23d St., Pittsburg, Pa.
(See page 187.)

DIAMOND Cork Co., 59 Pearl St., New York, N. Y.

MUNDET & Son, L., King, Ferris & Sullivan Sts., Brooklyn, N. Y.

PADDOCK Cork Co., 1209-17 DeKalb Ave., Brooklyn, N. Y.

SPANISH-AMERICAN Cork Co., 2211 Pennsylvania Ave., Baltimore, Md.

METAL FLOATS

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn.
(See page 685.)

GOODNOW & Blake Mfg. Co., Fourth & Porter Sts., Detroit, Mich.

HERCULES Float Works, 200-10 Franklin St., Springfield, Mass.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

NAUGATUCK Mfg. Co., Naugatuck, Conn.

FORGINGS

DROP FORGINGS

ACCESSORY Forgings Co., 1440 Orleans St., Detroit, Mich.

AJAX Forge Co., 2503 Blue Island Ave., Chicago, Ill.

AMERICAN Forge & Machine Co., 1424 Barth Ct., Canton, O.

ANDERSON Forge & Machine Co., Detroit, Mich.
(See page 231.)

ATLAS Drop Forge Co., Lansing, Mich.
(See page 241.)

ATWATER Mfg. Co., Southington, Conn.

BARNETT Drop Forging Co., East Hampton, Mass.
(See page 233.)

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All the Obvious Advantages of Steel Over Wood Are Offered Users of

PARKER-HYDRAULIC PRESSED STEEL WHEELS

TO THE DEALER: These wheels offer a wonderful opportunity to live dealers. They are made in standard sizes, can be easily attached in a few minutes, sell easily, and stay sold. Write for our attractive dealer's proposition today before some other dealer "beats you to it."

These wheels are formed from two pieces of steel plate. They are unbreakable—yet weigh but half as much as wooden wheels with demountable rims.

They give you the easiest and quickest demountable rims. Tires can be changed with them in half the time required with a bolt and wedge type of rim.

They reduce unsprung weight. Ready for demountable rims they weigh only 53% as much as the equivalent wooden wheel parts.

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It will pay car manufacturers to investigate Parker-Hydraulic Pressed Steel Wheels. They cost no more yet they give the car owner absolute safety, easier and quicker demountable rims and greatly reduce unsprung weight.

These Wheels Manufactured under the Gibson Patent

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15 Acres of Pressed Steel Capacity

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When you build your car on "Hydraulic" Pressed Steel Frames you are insuring your future business.

HYDRAULIC PRESSED STEEL FRAMES

are used by the world's foremost motor car builders both here and abroad. Their quality is reflected in the high standard of these celebrated cars. These manufacturers know, better than we, the quality and absolute dependability of "Hydraulic" Frames.

"Hydraulic" Frames are made in the most modern plant in America, by men who have made frames a life study. Just the right materials, scientifically treated—combined with our wonderful manufacturing facilities, **plus** that indispensable "know-how," result in the product recognized as the standard the world over.

"Hydraulic" Pressed Steel Brake Drums, Step Hangers, etc., are of the same high quality as "Hydraulic" Frames.

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THE HYDRAULIC PRESSED STEEL CO.

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15 Acres of Pressed Steel Capacity

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QUALITY

CRANKSHAFTS
Four and Six Throw

Connecting Rods—Camshafts—Gears—Clutch Drums and Forks—Control Levers, etc.

UPSET FORGINGS
Drive Shafts—Wheel Hubs—Counterweights—Worm and Bevel Gears, Etc.

HEAT TREATMENT
We Specialize in the Proper Heat Treatment of Alloy and Open Hearth Steels

SERVICE

Anderson Forge & Machine Co.
DETROIT, MICHIGAN

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FORGINGS (Continued)

DROP FORGINGS (Continued)

BELDEN Machine Co., Whalley Ave. & Tryon St., New Haven, Conn.

BETHLEHEM Steel Co., Third & Poplar Sts., South Bethlehem, Pa.

BILLINGS & Spencer Co., Hartford, Conn.

BLAKESLEE Forging Co., Plantsville, Conn.

BUFFALO Drop Forge Co., 53-59 Carroll St., Buffalo, N. Y.

CANTON Drop Forging & Mfg. Co., Canton, O.
(See page 689.)

CAPE Ann Tool Co., Granite St., Pigeon Cove, Mass.

CHAMPION Machine & Forging Co., 3725 E. 78th St., Cleveland, O.
(See page 831.)

CHICAGO Drop Forge & Foundry Co., 447-517 Kensington Ave., Chicago, Ill.

CHRISTIE-KLINE Forge Co., 60 St. Aubin Ave., Detroit, Mich.

CLAPP Mfg. Co., E. D., 305 Genesee St., Auburn, N. Y.

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

COLUMBIAN Hardware Co., 1296 E. 53d St., Cleveland, O.

COLUMBUS Bolt Works Co., Columbus, O.
(See page 119.)

COLUMBUS Forge & Iron Co., Columbus, O.
(See page 515.)

CONSOLIDATED Mfg. Co., Toledo, O.

CORTLAND Forging Co., Cleveland St., Cortland, N. Y.

CRESCENT Forgings Co., Oakmont, Pa.

DEAN Forging Co., 1825 E. Jackson St., Muncie, Ind.

DETROIT Forging Co., 120 Mt. Elliott St., Detroit, Mich.

DIAMOND Forging & Mfg. Co., Pittsburg, Pa.

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

DROP Forging Co. of New York, 801 West Side Ave., Jersey City, N. J.

ECCLES Co., Richard, Auburn, N. Y.

ELLIOTT, H. A., Majestic Bldg., Detroit, Mich. (Importer.)

EUREKA Co., North East, Pa.
(See page 333.)

FROST Gear & Forge Co., Jackson, Mich.
(See page 251.)

FRUIN Drop Forge Co., 347 Root St., Chicago, Ill.

FULTON Machine & Forging Co., Canal Fulton, O.

GENERAL Drop Forge Co., Buffalo, N. Y.
(See page 827.)

GLOBE Malleable Iron & Steel Co., Syracuse, N. Y.

HERBRAND Co., Fremont, O.
(See page 679.)

HERCULES Forge Co., S. Senate Ave. & Merrill St., Indianapolis, Ind.

INDIANAPOLIS Drop Forging Co., Madison Ave. & Dowling St., Indianapolis, Ind.

INGALLS-SHEPARD Forging Co., Michigan Ave. & Van Buren St., Chicago, Ill.
(See page 719.)

JACKSON Drop Forging Co., Jackson, Mich.

KEYSTONE Forging Co., Duke & Front Sts., Northumberland, Pa.

KILBORN & Bishop Co., Chapel & Lloyd Sts., New Haven, Conn.

KROPP Forge Co., 2508-22 W. 21st St., Chicago, Ill.

KRUPP—See Prosser & Son.

LADISH-OBENBERGER Co., Cudahy, Wis.
(See page 799.)

LAKESIDE Forge Co., East Lake Rd., Erie, Pa.

McDOUGALL & Potter Co., 606 W. 53th St., New York, N. Y.

McKAY Co., James, McKees Rocks, Pa.

MACHINERY Forging Co., Hamilton & Marquette Sts., Cleveland, O.

MARTIN Forging Co., H. J., 510 Harding St., Indianapolis, Ind.

MERRILL Bros., Maspeth, N. Y.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727 and 819.)

MICHIGAN Bolt & Nut Works, ft. Meldrun Ave., Detroit, Mich.

MOORE Drop Forging Co., Birnie Ave., Springfield, Mass.

NEW England Forge Co., 9 Plymouth St. Worcester, Mass.

O. K. Tool Holder Co., Shelton, Conn.

OHIO Forge Co., Cleveland, O.
(See page 545.)

OLIVER Iron & Steel Co., Pittsburg, Pa.

PARK Drop Forge Co., Cleveland, O.
(See page 199.)

PITTSBURGH Knife & Forge Co., Pittsburgh, Pa.
(See page 835.)

PORTLAND Forge & Foundry Co., Portland, Ind.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

QUEEN City Forging Co., Cincinnati, O.

RELIANCE Engineering Co., Lansing, Mich.

REVERE Drop Forge Co., Revere, Mass.

RICHMOND Forging Corp. (Acca Station), Richmond, Va.

RIVETLESS Chain & Engineering Co., Avon, Pa.

ROCKFORD Drop Forge Co., 19th Ave. & Tenth St., Rockford, Ill.

SEWARD & Son Co., M., Grant St., New Haven, Conn.

SMITH Co., A. O., Milwaukee, Wis.
(See page 481.)

SMITH & Co., H. D., Plantville, Conn.

SPICER Mfg Co., South Plainfield, N. J.
(See page 747.)

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

SUNDBERG Co., Kinzie & Carpenter Sts., Chicago, Ill.

TRANSUE & Williams Co., 580 W. Ely St., Alliance, O.
(See page 785.)

UNION Drop Forge Co., 358 W. Indiana St., Chicago, Ill.

Complete Index to Classification appears on Pages 8 to 27.

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DROP FORGINGS

of every description

It takes elaborate and expensive facilities for turning out Drop Forgings promptly, accurately and economically. We are prepared to produce anything you may need and almost as quickly as you might desire it.

Whether large or small we can turn out Forgings with the greatest facility. Our prices also are most attractive because we are in a position to manufacture at the greatest advantage.

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BARNETT DROP FORGING COMPANY

Easthampton, Mass.

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FORGINGS (Continued)

DROP FORGINGS (Continued)

UNION Forging Co., Union, N. Y.
(See page 787.)

WAVERLY Co., 129 S. East St., Indianapolis, Ind.

WESTERN Drop Forge Co., Marion, Ind.
(See page 821.)

WESTERN Malleable Steel Co., 1250 Jefferson Ave., W., Detroit, Mich.

WESTERN Tool & Forge Co., Brackenridge, Pa.

WHITMAN & Barnes Mfg. Co., Akron, O.

WILCOX, Crittenden & Co., 88 Main St., Middletown, Conn.

WILCOX Mfg. Co., D., Mechanicsburg, Pa.

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

WYMAN-GORDON Co., Worcester, Mass.
(See Back Bone.)

FRAMES

PRESSED STEEL FRAMES

DETROIT Pressed Steel Co., 1800 Mt. Elliott Ave., Detroit, Mich. "Presteel."
(See page 281.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 368.)

FORSYTH Bros. Co., Chicago, Ill.
(See page 241.)

HYDRAULIC Pressed Steel Co., 3180 E. 61st St., Cleveland, O.
(See pages 229 and 230.)

PARISH Mfg. Co., Reading, Pa.
(See page 709.)

PARISH & Bingham Co., Cleveland, O.
(See page 235.)

PRESTEEL—See Detroit Pressed Steel Co.

SMITH Co., A. O., Milwaukee, Wis.
(See page 481.)

FRICTIONS

FIBRE FRICTIONS

(For use in Friction Transmission)

DIVINE Bros. Co., 202 Whitesboro St., Utica, N. Y.

ROCKWOOD Mfg. Co., 1917 English Ave., Indianapolis, Ind.

FUSES

ELECTRIC FUSES

CHICAGO Fuse Mfg. Co., Chicago, Ill. "Union."
(See page 623.)

D. & W. Fuse Co., Providence, R. I.

ELECTRIC Fuseguard Co., 60 Shipman St., Newark, N. J.

GENERAL Electric Co., Schenectady, N. Y.

JOHNS-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y.

UNION—See Chicago Fuse Mfg. Co.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

GAGES

BATTERY GAGES

(Pocket Battery Testers. For Standard Instruments—See Ammeters)

ADVANCE—See Eldredge Electric Mfg. Co.

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

CEMCO—See Clark Electric Meter Co.

CLARK Electric Meter Co., 1330 12th St., Detroit, Mich. "Cemco."
(See page 663.)

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

DOW Mfg. Co., 131 Adams St., Braintree, Mass.

ECLIPSE—See Eldredge Electric Mfg. Co.

ELCO—See Eldredge Electric Mfg. Co.

ELDREDGE Electric Mfg. Co., 7 Post Office Sq., Springfield, Mass. "Advance," "Elco," "Eclipse," "Midget."

EVEREADY—See American Ever Ready Works.

GRAY & Davis, Boston, Mass.
(See pages 483 to 486.)

HOYT Electrical Instrument Works, Penacook, N. H. "Utility," "Ultimate."
(See page 623.)

LUCAS Electric Device Co., Lagrange, Ind.

MIDGET—See Eldredge Electric Mfg. Co.

PENNSYLVANIA Rubber & Supply Co., 1845-47 Euclid Ave., Cleveland, O. "Prsco."

PRSCO—See Pennsylvania Rubber & Supply Co.

READRITE Meter Works, 22 Main St., Bluffton, O.

RELIANCE Instrument Co., 1135 Van Buren St., Chicago, Ill.

SHOLDER-EXCEL Mfg. Co., Clyde, O.

STERLING Mfg. Co., Blackstone Bldg., Cleveland, O. "Trescot."

TRESCOT—See Sterling Mfg. Co.

ULTIMATE—See Hoyt Electrical Instrument Works.

UTILITY—See Hoyt Electrical Instrument Works.

WAGNER Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

BOILER WATER-LINE GAGES

(For indicating height of water in steam boilers)

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

Complete Index to Classification appears on Pages 8 to 27.

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Quality and Service

Our advanced factory equipment and thorough knowledge of builders' needs place us in a position to satisfy you as to quality.

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They mean much to you, Mr. Automobile Builder.

The Parish & Bingham Co.

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Cleveland, Ohio

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GAGES (Continued)

BOILER WATER-LINE GAGES (Continued)

RELIABLE Water Gauge Co., 1616 Pine St., St. Louis, Mo.

SCHAEFFER & Budenberg Mfg. Co., 481 De Kalb Ave., Brooklyn, N. Y.

WILTBONCO Mfg. Co., 10 Post Office Sq., Boston, Mass.

CYLINDER COMPRESSION GAGES

(For testing compression in gas engine cylinders)

AZADIAN Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

FOXBORO Co., Foxboro, Mass.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill.
(See page 735.)

UNITED States Gauge Co., New York, N. Y.
(See page 237.)

GASOLINE TANK GAGES

(For indicating amount of gasoline in fuel tanks)

AKRON-SELLE Co., High & Chestnut Sts., Akron, O.

AZADIAN Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

BOSTON Auto Gage Co., 8-12 Waltham St., Boston, Mass. "Triumph," "Challenge."
(See page 241.)

CHALLENGE—See Boston Auto Gage Co.

CHALLENGE—See Rickley Auto Specialty Co.

DAVENPORT—See Motor Shop.

FUEL Meter Co., 937 E. 54th St., Chicago, Ill.

GEM Stamped Steel Co., Chelsea, Mass.
(See page 479.)

IMPERIAL Fluid Gauge Co., Canton, O.

LUCAS Electric Device Co., Lagrange, Ind.

MODERN Specialty Co., 212 Fifth St., Racine, Wis.

MOTOR Shop, 238 Massachusetts Ave., Indianapolis, Ind. "Davenport."

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

PALMER—See Rickley Auto Specialty Co.

PFAHL Gauge & Mfg. Co., Akron, O.

RETLAW Mfg. Co., 654-58 Franklin St., Detroit, Mich.

RICKLEY Auto Specialty Co., Nasby Bldg., Toledo, O. "Challenge," "Palmer."

RITZ GASOMETER—See Ritz-Woller Co.

RITZ-WOLLER Co., Oliver C., 160 N. Fifth Ave., Chicago, Ill. "Ritz Gasometer."

ROCHESTER Mfg. Co. (Brighton Station), Rochester, N. Y.
(See page 839.)

RUDELL Gasoline Indicator Co., 1716 Crenshaw Blvd., Los Angeles, Cal.

TRIUMPH—See Boston Auto Gage Co.

WEISS Mfg. Co., Torrington, Conn.

STEAM AND AIR GAGES

(Standard Pressure Gages)

AMERICAN Steam Gauge & Valve Mfg. Co., 220 Camden St., Boston, Mass.

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

AZADIAN Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

BELFIELD Co., H., 485 N. Broad St., Philadelphia, Pa.

FOXBORO Co., Foxboro, Mass.

IMPROVED Gauge Mfg. Co., 356 W. Water St., Syracuse, N. Y.
(See page 241.)

MARSH & Co., Jas. P., 118-24 S. Clinton St., Chicago, Ill.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill.
(See page 735.)

SCHAEFFER & Budenberg Mfg. Co., 481 De Kalb Ave., Brooklyn, N. Y.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

UNITED States Gauge Co., New York, N. Y.
(See page 237.)

TIRE PRESSURE GAGES

(For indicating pressure in tires—See also Valves Tire Safety)

ALLEN Auto Specialty Co., 1926 Broadway, New York, N. Y. "Tyrometer."
(See page 163.)

AMERICAN Sanitary Lock Co., 1072-80 S East St., Indianapolis, Ind. "Pop-Off."

AZADIAN Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

BARNARD Specialty Co., 3300 Maple Ave., Los Angeles, Cal.

BELL Brass Mfg. Co., White Bldg., Seattle, Wash. "Evertite."

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

ECLIPSE—See Edelmann & Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill. "Reliable," "Eclipse."

EVERTITE—See Bell Brass Mfg. Co.

GOODRICH Co., B. F., Akron, O.

HANSEN Mfg. Co., Illuminating Bldg., Cleveland, O.

HILL Pump Valve Co., Archer Ave., Canal & 23d Sts., Chicago, Ill. "Pneu-Meter."

IMPROVED Gauge Mfg. Co., 356 W. Water St., Syracuse, N. Y.
(See page 241.)

INVINCIBLE—See United States Gauge Co

KELLOGG Mfg. Co., Rochester, N. Y.
(See page 413.)

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill.
(See page 735.)

NOE, Seaman P., Asbury Park, N. J.

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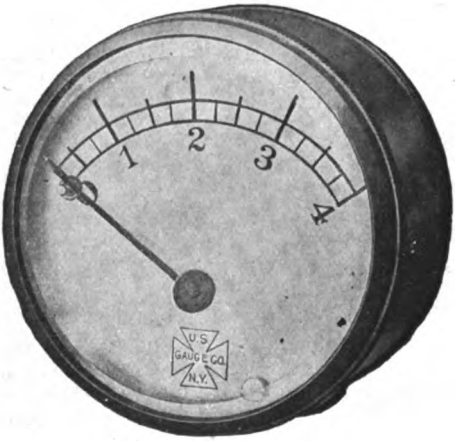
United States Gauge Co.



New York
Chicago
Detroit

If It's a Gauge
We Make It

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GAGES (Continued)

TIRE PRESSURE GAGES (Continued)

NURINKLE—See Stevenson, R. E.

PNEU-METER—See Hill Pump Valve Co.

POP-OFF—See American Sanitary Lock Co.

RELIABLE—See Edelmann & Co.

SCHRADER'S Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y.
(See page 255.)

STEVENSON, R. E., 518 N. Capitol Ave., Indianapolis, Ind. "Nurinkle."

TWITCHELL Gauge Co., 1208 Michigan Ave., Chicago, Ill.
(See page 239.)

TYROMETER—See Allen Auto Specialty Co.

UNITED States Gauge Co., New York, N. Y. "Invincible."
(See page 237.)

WATER CIRCULATION GAGES

(For indicating pressure in water cooling systems)

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

AZADIAN Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

FOXBORO Co., Foxboro, Mass.

IMPROVED Gauge Mfg. Co., 356 W. Water St., Syracuse, N. Y.
(See page 241.)

SCHAEFFER & Budenberg Mfg. Co., 481 De Kalb Ave., Brooklyn, N. Y.

WHEEL ALIGNING GAGES

MECHANICAL Utilities Co., 5 N. La Salle St., Chicago, Ill.

GALVANIZING

GALVANIZING, SHERARDIZING AND RUST-PROOFING

AMERICAN Chain Co., Bridgeport, Conn.
(See page 157.)

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

BONTEMPI Rust-Proofing Co., 353 Water St., Bridgeport, Conn.

BUFFALO Galvanizing & Tinning Works, 49-53 Jackson St., Buffalo, N. Y.

CLEVELAND Galvanizing Works Co., Cooper Ave. & P. R. R., Cleveland, O.

CRAMP & Sons Ship & Engine Bldg. Co., William, Philadelphia, Pa.
(See page 335.)

DANA Mfg. Co., Cincinnati, O.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

FORE River Shipbuilding Corp., Quincy, Mass.

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis.
(See page 479.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

GRABLER Mfg. Co., Cleveland, O.

MALLEABLE Iron Fittings Co., Branford, Conn.

MEAKER Galvanizing Co., Fulton & Elizabeth Sts., Chicago, Ill.

METAL Treating & Equipment Co., 334 Humboldt St., Brooklyn, N. Y.

NATIONAL Galvanizing Co., 1918-26 Carroll Ave., Chicago, Ill.

NEW Haven Sherardizing Co., State & Lawrence Sts., New Haven, Conn.

NEWARK Stamping & Foundry Co., Newark, O.

OHIO Sherardizing Co., Whitney Power Blk., Cleveland, O.

R. I. Welding & Sherardizing Co., Promenade & Park Sts., Providence, R. I.

ROCKFORD Metal Specialty Co., 720 S. Main St., Rockford, Ill.

SCOTT, C. U., head of Wall St., Davenport, Ia.

SHERARDIZING Co. of Illinois, 567 W. Van Buren St., Chicago, Ill.

STANLEY Works, New Britain, Conn.
(See page 269.)

UNION Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.

U. S. Electro-Galvanizing Co., 1-9 Park Ave., Brooklyn, N. Y.

VAIL Galvanizing Plant, 209-11 Commercial St., Boston, Mass.

GAPS

SPARK GAPS

B. & M. Mfg. Co., 538 Muskego Ave., Milwaukee, Wis.

BI-SPARK Plug Co., Toledo, Ia.

BREMER & Mooney Mfg. Co., 538 Muskego St., Milwaukee, Wis.

BUNCH & Co., Marshall, Mo. "Gottospark."

GORMAN Co., J. P., 47 W. 42d St., New York, N. Y.

GOTTOSPARK—See Bunch & Co.

HERZ & Co., 245 W. 55th St., New York, N. Y. "Oscillum."
(See page 389.)

HICKERSON, B. F., Examiner Bldg., San Francisco, Cal.

JACKSON & Co., W., New York Life Bldg., Chicago, Ill.

LAZARUS Mfg. Co., Belmont Bldg., Cleveland, O. "Lazco."

LAZCO—See Lazarus Mfg. Co.

MASTER Spark Co., Examiner Bldg., San Francisco, Cal.

NORTHERN Mfg. Co., 1790 Broadway, New York, N. Y.

OLD BOY—See P. S. E. Mfg. Co.

OSCILLUM—See Herz & Co.

P. S. E. Mfg. Co., 1777 Broadway, New York, N. Y. "Old Boy"

PITTSBURGH Electric Specialties Co., Ross & First Sts., Pittsburgh, Pa.

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Consequently the best Gauge to *Sell*—

The Positive Lock Stop Twitchell Air Gauge

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Our experience has convinced us that we are manufacturing such an article in the

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Both this year and last year, we had difficulty in satisfying the demand.

Don't waste your time and strength trying to push something that is anchored and can't move.

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Stock Goods for which there is a demand

Our advertising in Trade and National Magazines will be increased in order to stimulate this demand still further

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GAPS (Continued)

SPARK GAPS (Continued)

PRONTO Mfg. & Sales Co., 539 Paxton Blk., Omaha, Neb.

ROYAL Tester Co., Pittsburg, Pa.

RUTLEDGE, Uel Alvin, Charlotte, N. C.

SMITH & Gunn, 22-26 E. Broad St., Burlington, N. J.

X-RAY Plug Detector Co., Pleasant Lake, Ind.

GARAGES

PORTABLE GARAGE BUILDINGS

ALADDIN—See North American Construction Co.

AMERICAN Portable House Co., Arcade Bldg., Seattle, Wash.

ANCHOR Corrugating Construction Co., 140 Washington St., New York, N. Y.

ASHLEY Steel Building Co., 1790 Broadway, New York, N. Y.

BOSSERT & Sons, Louis, Grand St., & Newtown Creek, Brooklyn, N. Y.

BURNHAM-STANDEFORD Co., Washington & First Sts., Oakland, Cal.

BUTLER Mfg. Co., 1324 Grand Ave., Kansas City, Mo.

CANDLER Co., Geo. V., 1092 Jefferson Ave., E., Detroit, Mich.

CATHERMAN, J. A., Beaver Springs, Pa.

CHESBRO-WHITMAN Co., 1167 First Ave., New York, N. Y.

CRAIG, David, 70 Broad St., Boston, Mass.

DUCKER Co., 277 Broadway, New York, N. Y.

DULUTH Corrugating & Roofing Co., Duluth, Minn.

EDWARDS Mfg. Co., 724-74 Eggleston Ave., Cincinnati, O. "Steelcote."

ESLIEN Sheet Metal Works, 1001 30th St., Milwaukee, Wis.

FARGO Cornice & Ornament Co., 1002-04 Front St. Fargo, N. Dak. "Rusk."

GARAGE Construction Co., Oliver Ave. & Grant St., Pittsburgh, Pa. (See page 667.)

GORDON Mfg. Co., Middletown, O.

GOULD'S All Steel Garage, 87 Adams St., Quincy, Mass.

HARRY Steel Co., O. K., 2232-35 Papin St., St. Louis, Mo.

HODGSON Co., E. F., 116 Washington St., Boston, Mass. "Wigwam."

IDEAL Sectional Building Co., St. Johns, Mich.

KAHN—See Trussed Concrete Steel Co.

KARR Portable House Co., 2554 W. Irving Park Blvd., Chicago, Ill.

KENYON Co., R. L., Waukesha, Wis.

KOLB Co., 30 Church St., New York, N. Y.

MECCO—See Moeschl-Edwards Corrugating Co.

MERSHON & Morley Co., Saginaw, Mich.

METAL Shelter Co., 17 Battery Pl., New York, N. Y. "Pruden."

MILLER Mfg. Co., 8000 Alabama Ave., St. Louis, Mo.

MOESCHL - EDWARDS Corrugating Co., Eighth & Ninth Sts., Covington, Ky. "Mecco."

MOWER, C. W., Paulsen Bldg., Spokane, Wash.

NATIONAL Lumber Mfg. Co., Dayton, O.

NORTH American Construction Co., Bay City, Mich. "Aladdin."

PINYOUN & Son, F. C., 2526 Carnegie Ave., Cleveland, O.

PRUDEN—See Metal Shelter Co.

PRUDEN Co., C. D., Warner, Dock & Bayard Sts., Baltimore, Md. "Prudential."

PRUDENTIAL—See Pruden Co.

RIVERSIDE Mfg. Co., 162-66 Riverside Ave., Newark, N. J.

ROGERS Co., J. S., Moorestown, N. J.

RUBY Mfg. Co., Jackson & Douglass Sts., Jackson, Mich. "Veribest."

RUSK—See Fargo Cornice & Ornament Co.

ST. Johns Portable Building Co., St. Johns, Mich.

SKINNER Co., Thomas, Quincy, Mass.

STEEL Portable Building Co., Chicago, Ill.

STEELCOTE—See Edwards Mfg. Co.

TAYLOR Mfg. Co., 219 Glenridge Ave., Montclair, N. J.

TRUSSED Concrete Steel Co., Youngstown, O. "Kahn."

VERIBEST—See Ruby Mfg. Co.

WIGWAM—See Hodgson Co.

GASKETS

METALLIC GASKETS

(For Asbestos, Composition or Rubber Gaskets—See Packing)

AKRON Metallic Gasket Co., 151 N. Union St., Akron, O.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Never-Leak." (See page 685.)

GASKET Supply Co., 1729 Ludlow St., Philadelphia, Pa. "Right." (See pages 765 and 795.)

HERZ & Co., 245 W. 55th St., New York, N. Y. (Importers.) (See page 389.)

McCORD Mfg. Co., Detroit, Mich. "McKim." (See pages 418 and 419.)

McKIM—See McCord Mfg. Co.

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

NEVER-LEAK—See Fitzgerald Mfg. Co.

PHOENIX Specialty Mfg. Co., 48-50 Duane St., New York, N. Y.

RIGHT—See Gasket Supply Co.

UNITED States Indestructible Gasket Co., 50 Church St., New York, N. Y.

VICTOR Mfg. & Gasket Co., Troy & 21st Sts., Chicago, Ill. (See page 455.)

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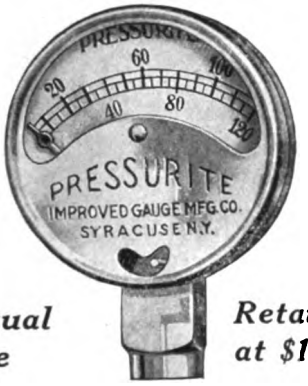
Pressurite Tire Tester



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Dorris	**Pullman**
F.I.A.T.	**Scripps-Booth**
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Jeffery	**Simplex**
Jordan	**Simplex-Crane**
Lancia	**Stanley**
Locomobile	**Stevens-Duryea**
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Moline	

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MUFFLERS

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CHICAGO

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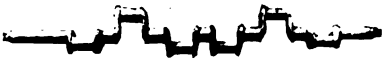

AXLES, CRANKS, GEARS

ANY STYLE, ANY DESIGN

ATLAS DROP FORGE CO., Lansing, Mich.

"THE CRANK MAKERS OF AMERICA"

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GASOLINE

AUTOMOBILE GASOLINE

BUCK & Co., E. A., Worcester, Mass. "Powero."

CREW Levick Co., Land Title Bldg., Philadelphia, Pa.

EMCO—See Emery Mfg. Co.

EMERY Mfg. Co., Bradford, Pa. "Emco."

ENERGINE Refining & Mfg. Co., The Arcade, Cleveland, O.

GULF Refining Co., Pittsburgh, Pa.

NATIONAL Refining Co., Rose Bldg., Cleveland, O. "White Rose."

PETROLEUM Products Co., 39th St. & B. & O. R. R., Pittsburgh, Pa. "Vigorite."

POWERO—See Buck & Co.

PURE Oil Co., Fifth & Chestnut Sts., Philadelphia, Pa.

RIVERSIDE Oil Co., Benedum Trees Bldg., Pittsburg, Pa.

STANDARD Oil Co. of N. Y., 26 Broadway, New York, N. Y.

TEXACO—See Texas Co.

TEXAS Co., 17 Battery Pl., New York, N. Y. "Texaco."

TIONA Refining Co., Madison Ave., & Belt Ry., Indianapolis, Ind.

ULLER, C. C., Tidioute, Pa.

VENTURA Mfg. Co., Title Insurance Bldg., Los Angeles, Cal.

VIGORITE—See Petroleum Products Co.

WAVERLY Oil Works Co., Pittsburg, Pa.
(See page 351.)

WHITE ROSE—See National Refining Co.

GATES

AUTOMATIC DRIVEWAY GATES

BYERLY—See Cargill Mfg. Co.

CARGILL Mfg. Co., West End of Buttles Ave., Columbus, O. "Byerly."

GAUNTLETS

MOTORISTS GAUNTLETS

(See Gloves, Motorists)

GEARS

DIFFERENTIAL GEARS

ADCO—See American Die & Tool Co.

AMERICAN Die & Tool Co., Reading, Pa. "Adco."
(See page 673.)

ANTI Gear Differential Co., 1009 Oley St., Reading, Pa.

BAILEY—See Gearless Differential Co.

BOSTON Gear Works, (Norfolk Downs), Quincy, Mass.
(See page 249.)

BROWN-LIPE-CHAPIN Co., Syracuse, N. Y.
(See page 306B.)

CROSS Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich.
(See page 609.)

CULLMAN Wheel Co., 1356 Altgeld St., Chicago, Ill.
(See page 669.)

DETROIT Standard Gear Co., 742 Woodbridge St., E., Detroit, Mich.

FROST Gear & Forge Co, Jackson, Mich.
(See page 251.)

GEARLESS Differential Co., 876 Woodward Ave., Detroit, Mich. "Bailey."

GRANT-LEES Gear Co., 2368 69th St., Cleveland, O.

LUXMORE Differential Co., 122 S. Michigan Ave., Chicago, Ill.

M & S Gear Co., 166 Lycaste St., Detroit, Mich.
(See page opposite Title Page.)

NEW Process Gear Corp., Syracuse, N. Y.
(See page 495.)

ROSS Gear & Tool Co., 800 Heath St., Lafayette, Ind.
(See page 245.)

RUSSEL Motor Axle Co., North Detroit, Mich.
(See page 778.)

RUSSEL Wheel & Foundry Co., Chene St. & Belt Line R. R., Detroit, Mich.

VAN Dorn & Dutton Co., Cleveland, O.
(See page 829.)

WARNER Gear Co., Muncie, Ind.
(See page 315.)

WARNER Mfg. Co., Toledo, O.
(See page 805.)

RUNNING GEARS

BORBEIN Auto Co., 2109-11 N. Ninth St., St. Louis, Mo.

DART Motor Truck Co., Ainsborough & Stratford Aves., Waterloo, Ia.

DAYTON, W. O., 103 W. Park Ave., Joliet, Ill.

DETROIT Chassis Co., 1059-65 W. Grand Blvd., Detroit, Mich.

PONTIAC Chassis Co., Pontiac, Mich.
(See page 839.)

STEERING GEARS

BARNES Gear Co., Oswego, N. Y.

BOSTON Gear Works, (Norfolk Downs), Quincy, Mass.
(See page 249.)

C. A. S. Products Co., Columbus, O.
(See pages 300 and 301.)

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CROSS Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich.
(See page 609.)

DITWILER Mfg. Co., Galion, O.

ECLIPSE Machine Co., Elmira, N. Y.
(See page 729.)

GEMMER Mfg. Co., Detroit, Mich.
(See page 802.)

GNOETH Steering Gear Co., 638 Sycamore St., Cincinnati, O.

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GEARS (Continued)

STEERING GEARS (Continued)

JACKSON-CHURCH-WILCOX Co., Saginaw, W. S., Mich. "Jacox."
(See page 243.)

JACOX—See Jackson-Church-Wilcox Co.

KEYSTONE-HINDLEY Gear Co., Pennsylvania Bldg., Philadelphia, Pa.

LAVINE Gear Co., Racine, Wis.
(See page 247.)

ROSS Gear & Tool Co., 800 Heath St., Lafayette, Ind.
(See page 245.)

S & W—See Schweppe & Wilt Mfg. Co.

SCHWEPPE & Wilt Mfg. Co., Detroit, Mich. "S & W"
(See page 415.)

SUPERIOR Machine & Engineering Co., 51-53 Fort St., E., Detroit, Mich.

TRIO Mfg. Co., 1192-1206 Bellevue Ave., Detroit, Mich.

WARNER Co., T. W., Kilgore & Perkins Aves., Muncie, Ind.

WARNER Gear Co., Muncie, Ind.
(See page 315.)

WILCOX-McKIM Co., Saginaw, Mich.

AUTOMATIC STARTER TRANSMISSION GEARS

(For automatically meshing pinion on starter motor with fly wheel gear)

BENDIX—See Eclipse Machine Co.

ECLIPSE Machine Co., Elmira, N. Y. "Bendix."
(See page 729.)

TRANSMISSION GEARS

ADCO—See American Die & Tool Co.

AMERICAN Die & Tool Co., Reading, Pa. "Adco."
(See page 673.)

BALL—See New York Gear Works.

BOSTON Gear Works, (Norfolk Downs), Quincy, Mass.
(See page 249.)

BRENNAN Motor Co., 105 Grape St., Syracuse, N. Y.

BROWN-LIPE Gear Co., Syracuse, N. Y.
(See page 306B.)

BUDA Co., Harvey, Ill.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CLIMAX Electric Works, New Salem, Mass.

COTTA Gear Co., 117-29 Morgan St., Rockford, Ill.

COTTA Transmission Co., 814-18 S. Main St., Rockford, Ill.
(See page 253.)

COVERT Motor Vehicle Co., Detroit, Mich.
(See page 801.)

CROSS Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich.
(See page 609.)

DART Motor Truck Co., Ainsborough & Stratford Aves., Waterloo, Ia.

DETROIT Gear & Machine Co., Detroit, Mich.
(See page 247.)

DETROIT Standard Gear Co., 742 Wodbridge St., E., Detroit, Mich.

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

DURSTON Gear Co., Syracuse, N. Y.

ENTZ Motor Patents Corp., 57th St. & Broadway, New York, N. Y.
(See page 829.)

FROST Gear & Forge Co., Jackson, Mich.
(See page 251.)

FULLER & Sons Mfg. Co., Kalamazoo, Mich.

GRANT-LEES Gear Co., 2368 69th St., Cleveland, O.

HOOSIER Auto Parts Co., Muncie, Ind.

KRICK Co., 1378 E. 55th St., Chicago, Ill.

LIGHT Mfg. & Foundry Co., Pottstown, Pa.
(See page 403.)

MECHANICS Machine Co., Ninth St. & 19th Ave., Rockford, Ill.
(See pages 300 and 301.)

MILLER Transmission Co., Karpen Bldg., Chicago, Ill.

MUNCIE Gear Works, Muncie, Ind.
(See page 705.)

NEW YORK Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y. "Ball."
(See page 807.)

PARKER Transmission & Appliance Co., Fulton, N. Y.

PITTSBURGH Model Engine Co., Pittsburgh, Pa.

ROCHESTER Motors Co., 5 Wren St., Rochester, N. Y.

SUPERIOR Machine Tool Co., Kokomo, Ind.

SUPERIOR Machine & Engineering Co., 51-53 Fort St., E., Detroit, Mich.

SYRACUSE Gear Co., 101 Grape St., Syracuse, N. Y.

TURLEY Gear & Machine Co., 1505-11 N. Tenth St., St. Louis, Mo.

VAN Dorn & Dutton Co., Cleveland, O.
(See page 829.)

WABASH Gear Works, Tenth & Farrington Sts., Terre Haute, Ind.

WARNER Co., T. W., Kilgore & Perkins Aves., Muncie, Ind.

WARNER Gear Co., Muncie, Ind.
(See page 315.)

WARNER Mfg. Co., Toledo, O.
(See page 805.)

YUSTER Axle & Transmission Co. of America, South Bend, Ind.

BLANK GEARS

(See also Forgings; also Castings)

ALBAUGH-DOVER Co., 2100 Marshall Blvd., Chicago, Ill.
(See page 673.)

ANDERSON Forge & Machine Co., Detroit, Mich.
(See page 231.)

ASHLEY Machine Works, 724 University Ave., Rochester, N. Y.
(See page 323.)

B. N. D.—See Elliott, H. A.

Complete Index to Classification appears on Pages 8 to 27.

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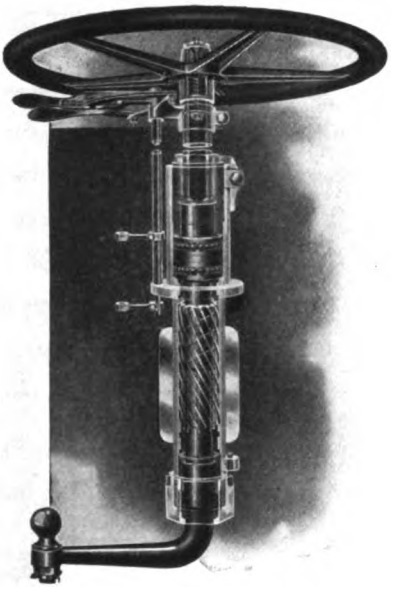

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Steering Gears

Built for over *nine years.*
Used on 90% of the trucks using cross steering.

Easy Steering
Longer Wear

Ross Steering Gears

Better Lubrication
No Adjustment

Fore & Aft
Steering Gears

Used on great majority of trucks using fore and aft steering.

Ross Gear & Tool Co.
800 Heath Street
Lafayette, Indiana

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GEARS (Continued)

BLANK GEARS (Continued)

BILLINGS & Spencer Co., Hartford, Conn.

COLUMBUS Forge & Iron Co., Columbus, O.
(See page 515.)

DETROIT Screw Works, Detroit, Mich.
(See page 849.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

ELLIOTT, H. A., Majestic Bldg., Detroit, Mich. (Importer.) "B. N. D."

GANSCHOW Co., Wm., 1001-05 Washington Blvd., Chicago, Ill.
(See page 635.)

GENERAL Drop Forge Co., Buffalo, N. Y.
(See page 827.)

GILL & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y.
(See page 669.)

GRANT-LEES Gear Co., 2368 69th St., Cleveland, O.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn.
(See page 383.)

JOLIET Forge Co., Irving & Franklin Sts., Joliet, Ill.

KRUPP—See Prosser & Son.

LADISH-OBENBERGER Co., Cudahy, Wis.
(See page 799.)

McINNES Steel Co., Corry, Pa.

MICHIGAN Screw Co., Lansing, Mich.

NEW England Forge Co., 9 Plymouth St., Worcester, Mass.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

REESE Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

U. S. Automatic Co., Amherst, O.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.
(See page 441.)

WYMAN-GORDON Co., Worcester, Mass.
(See Back Bone.)

METAL GEARS AND PINIONS

ADAMS Co., Dubuque, Ia.

ADCO—See American Die & Tool Co.

ALBAUGH-DOVER Co., 2100 Marshall Blvd., Chicago, Ill.
(See page 673.)

ALEXANDER & Cox Co., Ogden & Western Aves., Chicago, Ill.

AMERICAN Die & Tool Co., Reading, Pa. "Adco."
(See page 673.)

ANDERSON Rolled Gear Co., Berea Rd. & L. S. & M. S. R. R., Cleveland, O.

ARTHUR Co., 188 Front St., New York N. Y.

BAUSH Machine Tool Co., 500 Wason Ave., Springfield, Mass.

BEHRENDT, H. F., 22 Green St., Newark, N. J.

BILGRAM Machine Works, 1235 Spring Garden St., Philadelphia Pa.

BOSTON Gear Works, (Norfolk Downs), Quincy, Mass.
(See page 249.)

BROWN & Sharpe Mfg. Co., Promenade St., Providence, R. I.

BULTMAN Co., F. H., 2108 Superior Viaduct, Cleveland, O.

CARPENTER-TEW Gear Co., 67 35th St., Brooklyn, N. Y.

CINCINNATI Gear Co., 1825-33 Reading Rd., Cincinnati, O.

CLEVELAND Worm & Gear Co., Payne Ave. & E. 40th St., Cleveland, O.

CLIMAX Machinery Co., 143-63 E. Morris St., Indianapolis, Ind.

CROFOOT Gear Works, 31 Ames St., Cambridge, Mass.

CROSS Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich.
(See page 609.)

CURRIE & Son, J. B., 72 Adams St., Brooklyn, N. Y.

DETROIT Gear & Machine Co., Detroit, Mich.
(See page 247.)

DETROIT Standard Gear Co., 742 Woodbridge St., E., Detroit, Mich.

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

DUNDORE Mfg. Co., 221 S. Ninth St., Reading, Pa.

EARLE Gear & Machine Co., Stenton & Wyoming Aves., Philadelphia, Pa.

FEDERAL Gear Co., Cleveland, O.

FLATHER Mfg. Co., E. J., Nashua, N. H.

FOOTE Bros. Gear & Machine Co., 210-20 N. Carpenter St., Chicago, Ill.

FROST Gear & Forge Co., Jackson, Mich.
(See page 251.)

GANSCHOW Co., Wm., 1001-05 Washington Blvd., Chicago, Ill.
(See page 635.)

GEAR Grinding Machine Co., Chene St. & Boulevard, Detroit, Mich.

GLEASON Works, 1000 University Ave., Rochester, N. Y.

GOULD & Eberhardt, N. J. R. R. Ave. & Green St., Newark, N. J.

GRAND Machine Co., 2456 S. Grand Ave., St. Louis, Mo.

GRANT-LEES Gear Co., 2368 69th St., Cleveland, O.

HINDLEY Gear Co., 1105 Frankford Ave., Philadelphia, Pa.

HOOSIER Motor Co., 612-14 E. Madison St., Goshen, Ind.

INDIANAPOLIS Tool & Mfg. Co., 520 S. Capitol Ave., Indianapolis, Ind.

JACOBSON Machine Mfg. Co., Warren, Pa.
(See page 851.)

KEYSTONE-HINDLEY Gear Co., Pennsylvania Bldg., Philadelphia, Pa.

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass.
(See page 249.)

MEISSELBACH-CATUCCI Mfg. Co., Newark, N. J.

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Heat Treating

The True Efficiency

in the

Lavine Steering Gear

Lavine Steering Gear

Principal features which are:

Each and every wearing part is specially heat treated so that it may perform the function properly for which it is designed, to withstand the wear and strain, whether they may be shearing, bending, or torque.

There is no auto gear demand which we cannot supply, except a demand for any kind of an inferior make of gears.

Write for blue prints, specifications, and prices; or tell us all about your auto gear troubles.

Lavine Gear-Service is a service you can always command.

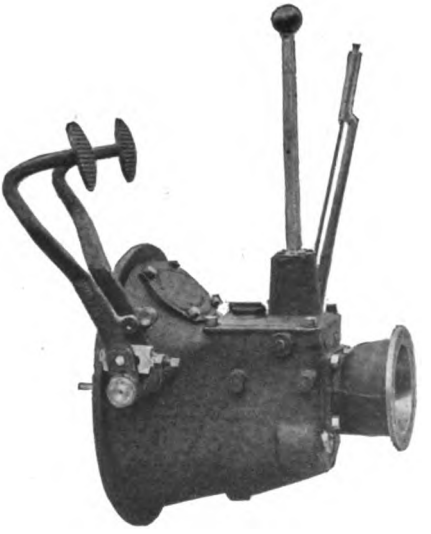
LAVINE GEAR CO., Racine, Wis.

Detroit Gear and Machine Co.

DETROIT, MICHIGAN

Transmission Manufacturers

UNIT POWER PLANT TRANSMISSIONS TO FIT ALL STANDARD MOTORS UP TO 40 H.P.



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GEARS (Continued)

METAL GEARS AND PINIONS (Continued)

NEW Process Gear Corp., Syracuse, N. Y. (See page 495.)

NEW YORK Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y. (See page 807.)

NEWARK Gear Cutting Machine Co., 67-69 Prospect St., Newark, N. J. (See page 823.)

NILSON-MILLER Co., 18th & Hudson Sts., Hoboken, N. J.

NORTHERN Engineering Works, 2 Chene St., Detroit, Mich.

NUTTALL Co., R. D., McCandless St. & Harrison Ave., Pittsburg, Pa.

PENNSYLVANIA Gear & Machine Co., 435 N. Broad St., Philadelphia, Pa. (See page 833.)

PHILADELPHIA Gear Works, 437 N. Broad St., Philadelphia, Pa.

PULLMAN-FIELD Machine Co., Basket St., Sodus, N. Y.

ROSS Gear & Tool Co., 800 Heath St., Lafayette, Ind. (See page 245.)

ROSS Machine Co., 208 S. Fourth St., La Fayette, Ind.

RUSSELL Wheel & Foundry Co., Chene St. & Belt Line R.R., Detroit, Mich.

SAWYER Gear Works, 227 St. Clair St., Cleveland, O.

SERVICE Gear & Machine Co., Reading, Pa. (See page 817.)

SIER-BATH Co., 143 W. 54th St., New York, N. Y. (See page 825.)

SOUTH Park Mfg. Co., Port Huron, Mich.

SPACKE Machine Co., F. W., Indianapolis, Ind. (See page 325.)

SYRACUSE Rawhide Mfg. Co., Niagara & Shonnard Sts., Syracuse, N. Y.

T. C. M. Mfg. Co., Hunterdon & First Sts., Harrison, N. J.

TIMKEN David Brown Co., 132 Clark Ave., Detroit, Mich.

TURLEY Gear & Machine Co., 1505-11 N. Tenth St., St. Louis, Mo.

VAN Dorn & Dutton Co., Cleveland, O. (See page 829.)

WABASH Gear Works, Tenth & Farrington Sts., Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind. (See page 315.)

WOBURN Gear Works, 82 Nashua St., Woburn, Mass.

WORCESTER Gear Works, 31 N. Foster St., Worcester, Mass.

RAWHIDE AND FIBRE GEARS AND PINIONS

BOSTON Gear Works, (Norfolk Downs), Quincy, Mass. (See page 249.)

CHICAGO Rawhide Mfg. Co., 1801 Elston Ave., Chicago, Ill.

CROFOOT Gear Works, 31 Ames St., Cambridge, Mass.

FABROIL—See General Electric Co.

GANSCHOW Co., Wm., 1001-05 Washington Blvd., Chicago, Ill. (See page 635.)

GENERAL Electric Co., Schenectady, N. Y. "Fabroil."

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 249.)

NEW Process Gear Corp., Syracuse, N. Y. (See page 495.)

NUTTALL Co., R. D., McCandless St. & Harrison Ave., Pittsburg, Pa.

PHILADELPHIA Gear Works, 437 N. Broad St., Philadelphia, Pa.

SYRACUSE Rawhide Mfg. Co., Niagara & Shonnard Sts., Syracuse, N. Y.

VAN DORN & Dutton Co., Cleveland, O. (See page 829.)

WOBURN Gear Works, 82 Nashua St., Woburn, Mass.

SPEEDOMETER GEARS AND PINIONS

MEIKLE, George, 803 E. Princeton Ave., Springfield, Ill. (See page 819.)

OGDEN Fibre Gear & Tire Co., Columbus, Ind.

GENERATORS

ACETYLENE GAS GENERATORS

(For Acetylene Tanks—See Tanks, Acetylene)

BADGER Brass Mfg. Co., Lyman Ave., Kenosha, Wis. "Solar."

BROWN Mfg. Co., John W., Columbus, O. (See page 307.)

CHICAGO Auto Lamp Works, 900-04 W. Lake St., Chicago, Ill.

COLUMBIA—See Hine-Watt Mfg. Co.

CORCORAN-VICTOR Co., Cincinnati, O. (See page 507.)

GRAY & Davis, Boston, Mass. (See pages 483 to 486.)

HAWTHORNE Mfg. Co., 48 Spruce St., Bridgeport, Conn. "Old Sol." (See page 307.)

HINE-WATT Mfg. Co., 130 N. Market St., Chicago, Ill. "Columbia."

HOFACKER Mfg. Co., 555 W. 42d St., New York, N. Y. (See page 293.)

NEVEROUT—See Rose Mfg. Co.

OLD SOL—See Hawthorne Mfg. Co.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

SOLAR—See Badger Brass Mfg. Co.

GLASS

POLISHED PLATE GLASS

BACHE & Co., Semon, West & Hubert Sts., New York, N. Y.

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Manufacturing
and
Cutting

AUTOMATIC SCREW MACHINE
PRODUCTS UP TO 5½" DIAMETER

Contract
Machine Work
and Parts

Hoists for
Automobile
Dumping
Bodies

Meisel Press Mfg. Co.
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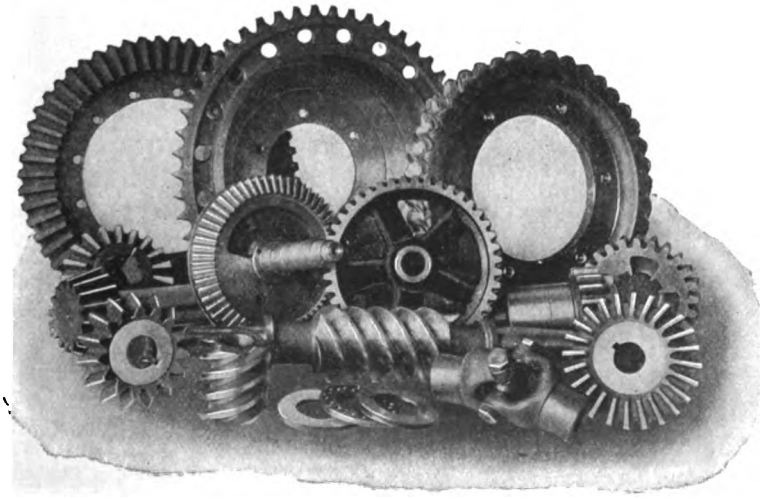
Boston, Mass.

BOSTON GEARS



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Spurs, Bevels, Miters, Worm Gears, Worms, Sprockets, Etc.
In Stock and Made to Order — Send for Catalogue E9 of Stock Gears
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GLASS (Continued)

POLISHED PLATE GLASS (Continued)

HARRIS, Chas. H., 142-46 W. 24th St., New York, N. Y.

HIRES Turner Glass Co., 30th & Walnut Sts., Philadelphia, Pa.

SMITH, Thos. J. D., 63-71 Chambers St., Newark, N. J.

SUPER-GLASS Co., 3400 Disston St. (Tacony), Philadelphia, Pa.

WIRE GLASS

(For use in Glass Fronts and Wind Shields)

MISSISSIPPI Wire Glass Co., 220 Fifth Ave., New York, N. Y.

GLASSES

GAUGE AND LUBRICATOR GLASSES

BACHE & Co., Semon, West & Hubert Sts., New York, N. Y.

MONCRIEFF—See Rogers Co.

PERTH—See Rogers Co.

ROGERS Co., H. A., 27 Walker St., New York, N. Y. (Importers.) "Moncrieff," "Unific," "Perth."

UNIFIC—See Rogers Co.

LAMP GLASSES

HOUZE Convex Glass Co., L. J., Jane St., Point Marion, Pa.

JEFFERSON Glass Co., Follansbee, W. Va.

LANCASTER Lens Co., 220-26 W. Main St., Lancaster, O.

GLOVES

ELECTRICALLY HEATED GLOVES

CARRON & Co., 61 Broadway, New York, N. Y.

MOTORISTS GLOVES AND GAUNTLETS

ALLEN & Sons, John C., Gloversville, N. Y.

AMERICAN Buffalo Robe Co., 1-7 Howell St., Buffalo, N. Y.

AMERICAN Glove Co., 2018 Churchill St., Chicago, Ill.

BISHOP Co., J. H., Wyandotte, Mich.

BLACK GHOST—See Heagle, James.

BRADFORD, R. E., 51 E. Fulton St., Gloversville, N. Y.

CROSBY-FRISIAN Fur Co., 571 Lyell Ave., Rochester, N. Y.

EISENDRATH Glove Co., 2001 Elston Ave., Chicago, Ill.

ELLSWORTH & Thayer Mfg. Co., 336-40 Broadway, Milwaukee, Wis. "Kantryp."

FRIED, Ostermann Co., 617-45 Reed St., Milwaukee, Wis. "Price."

GLOVERSVILLE Auto-Glove Co., W. Fulton & Cayadutta Sts., Gloversville, N. Y. "M. W. M."

GRINNELL—See Morrison-Ricker Mfg. Co.

GRIP-TITE—See Morrison-Ricker Mfg. Co.

HANSEN Mfg. Co., O. C., Detroit & Milwaukee Sts., Milwaukee, Wis.

HEAGLE, James, First Ave. & Market St., Johnstown, N. Y. "Black Ghost."

KANTRYP—See Ellsworth & Thayer Mfg. Co.

LA CROSSE Knitting Mills, La Crosse, Wis.

LIMP-KUFF—See Morrison-Ricker Mfg. Co.

LUTHER Glove Co., J. P., Berlin, Wis. "Red Ball."

M. W. M.—See Gloversville Auto Glove Co.

MORAWETZ Co., 217-25 E. Water St., Milwaukee, Wis.

MORRISON-RICKER Mfg. Co., 72 Broad St., Grinnell, Ia. "Grinnell," "Rist-Fit," "Grip-Tite," "Limp-Kuff."

PONTIAC Knitting Co., Pontiac, Mich.

PRICE—See Fried, Ostermann Co.

RED BALL—See Luther Glove Co.

RIPON Knitting Works, Ripon, Wis.

RIST-FIT—See Morrison-Ricker Mfg. Co.

SINCLAIR Glove Co., 1307 S. Union St., Los Angeles, Cal.

SYRACUSE & Eldridge Glove & Legging Co., 107 N. Franklin St., Syracuse, N. Y.

WALLACE Co., Hugh, 2626 E. Grand Boulevard, Detroit, Mich.

GOGGLES

MOTORISTS GOGGLES AND EYE SHIELDS

ADAMS, William C., 332 Boylston St., Boston, Mass.

ALBEX—See Willson & Co.

AMERICAN Optical Co., Southbridge, Mass.

AMERICAN Spectacle Co., 47 W. 34th St., New York, N. Y.

AMERICAN Thermo Ware Co., 16 Warren St., New York, N. Y. (Importers.) "Autocrat."

ARISTOCRAT—See Cohn & Co.

AUTOCRAT—See American Thermo Ware Co.

AUTOGLAS—See Hardy Co.

BOSTON—See Chicago Eye Shield Co.

BUFFALO Optical Co., 574 Main St., Buffalo, N. Y.

CHEYENNE—See Chicago Eye Shield Co.

CHICAGO Eye Shield Co., 2300 Warren Ave., Chicago, Ill. "Boston," "Rex," "Panama," "Cheyenne."

COHN & Co., Max G., 19 Madison Ave., New York, N. Y. "Peerless," "Turtle," "Tourist," "Aristocrat," "Elite."

Complete Index to Classification appears on Pages 8 to 27.

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Gears and Drop Forgings in Quantity for Automobiles

Frost Gear and Forge Co.

JACKSON, MICH.

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GOGGLES (Continued)

MOTORISTS GOGGLES AND EYE SHIELDS (Continued)

COVER, H. S., 6 Chippewa Ave., South Bend, Ind.

DE LUXE—See Griffin, G. A.

DIMMER Goggle Co., Whiting, Ind.

EFF & SEE—See Frank & Co., Arthur.

ELITE—See Cohn & Co.

ESSEX Rubber Co., Trenton, N. J.

FRANK & Co., Arthur, 71-73 Nassau St., New York, N. Y. "Eff & See."

GRIFFIN, G. A., 110 E. 23d St., New York, N. Y. "De Luxe."

HACO—See Hudson Products Co.

HARDY Co., F. A., 10 S. Wabash Ave., Chicago, Ill. "Autoglas."

HUMACO—See Humboldt Mfg. Co.

HUMBOLDT Mfg. Co., 266 Hyde Park Ave. (Forest Hills), Boston, Mass. "Humaco."

HUDSON Products Co., 44 E. 23d St., New York, N. Y. "Haco."
(See page 253.)

KEYSTONE—See Willson & Co.

KING Optical Co., F. W., Ellastone Bldg., Cleveland, O.

LEASURE Eye & Nose Shield Co., 415 Paulson Ave., Pittsburgh, Pa.

NON-STRAIN—See Opthalmuscope Co.

OPTHALMUSCOPE Co., 487 Dorr St., Toledo, O. "Non-Strain."

PANAMA—See Chicago Eye Shield Co.

PEERLESS—See Cohn & Co.

PENNSYLVANIA Optical Co., 125 S. Fifth St., Reading, Pa.

REX—See Chicago Eye Shield Co.

STANDARD Optical Co., Geneva, N. Y. "Stoco."

STOCO—See Standard Optical Co.

STRAUSS & Buegeleisen, 489 Fifth Ave., New York, N. Y.

SUSSFELD, Lorsch & Co., 90 Maiden Lane, New York, N. Y.

TOURIST—See Cohn & Co.

TURTLE—See Cohn & Co.

WILLSON & Co., T. A., Second & Washington Sts., Reading, Pa. "Albex," "Zylbex," "Keystone."

ZYLBEX—See Willson & Co.

GONGS

MECHANICAL GONGS

(See Bells, Mechanical)

GOVERNORS

GASOLINE ENGINE GOVERNORS

(For keeping the Speed of a Car below Predetermined Limits)

DUPLE Engine-Governor Co., 35 Flatbush Ave., Brooklyn, N. Y.

EVANS—See Hoffecker Co.

HOFFECKER Co., Garden Bldg., Boston, Mass. "Evans."

KRAMER—See Monarch Governor Co.

MONARCH Governor Co., 12th St. & Bethune Ave., Detroit, Mich. "Kramer."

PIERCE Speed Governor Co., Anderson, Ind.

STEELE, W. M., 98 Beacon St., Worcester, Mass.

GRAPHITE

LUBRICATING GRAPHITE

(For Graphite Grease—See Lubricants)

ACHESON Graphite Co., Buffalo & Portage Sts., Niagara Falls, N. Y.

ASBURY Specialty Co., Asbury, N. J.

CHESTER Graphite Co., Chester Springs, Pa.

DIXON Crucible Co., Joseph, Jersey City, N. J.
(See page 253.)

UNITED States Graphite Co., Saginaw, Mich.

WISCONSIN Graphite Co., Stevens Point, Wis.

GREASES

CUP AND GEAR GREASES

ACHESON Oildag Co., Port Huron, Mich. "Gredag."

ADMSCO—See Millers Sons Co.

ADVANCE Grease Co., Jackson, Mich.

ADVANCE Oil Works, 810-12 Flushing Ave., Brooklyn, N. Y.

ALBANY Lubricating Co., 708-10 Washington St., New York, N. Y. "Cooks."

ALEXANDER & Co., H. T., 17 Battery Pl., New York, N. Y. "Grand Prix."

AMALIE—See Sonneborn Sons.

AMERICAN—See Miller Co.

AMERICAN Oil Co., Jackson, Mich. "Amoco," "Gearo."

AMOCO—See American Oil Co.

ARCO—See Atlantic Refining Co.

ATLANTIC Refining Co., Euclid Ave. & E. 65th St., Cleveland, O. "Arco."

ATLAS—See Swan & Finch Co.

AURORA—See Pigot-Sayre Co.

AUTO Oil Co., 172 S. Water St., Jackson, Mich. "Diamond Cross."

AUTOGREASE—See Ilsley, Doubleday & Co.

AUTOSPONGE—See Vacuum Oil Co.

BADGER—See Wadhams Oil Co.

BALKAN—See Jones & Bro., J.

BALSO Oil Co., 238 Erie St., Toledo, O.

BANNER—See Clarkson & Ford Co.

BAUM'S Castorine Co., 104 N. George St., Rome, N. Y.

BELL Oil Co., 53 E. Ferry St., St. Louis, Mo. "Liberty Bell."

BESLY & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill. "Helmet."

BEST—See Van Tilburg Oil Co.

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Transmission and Differential
Grease No. 677

This special mixture is the only safe lubricant for the transmissions and differentials of cars and trucks because it is the only lubricant which actually identifies itself with the metal of the gears. The veneer of pure graphite built up on the metal substitutes anti-friction surfaces of oily graphite for the friction-creating metal surfaces. Wear is minimized, noise eliminated, and long life assured. Study the problem of lubrication and lubricants in Automobile Literature No. 85.

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Joseph Dixon Crucible Company
Established 1827

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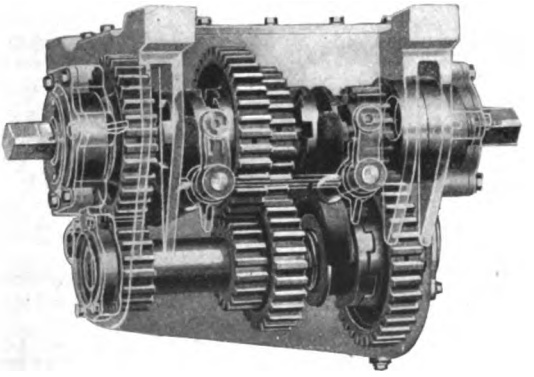
ZYLONITE
AUTO GOGGLES
AND
SUN GLASSES

They fight the dust—
and kill the glare.
Worn by the best
people everywhere.

Manufactured by
HUDSON PRODUCTS CO.
44 East 23rd St., New York City

COTTA TRANSMISSIONS
One to ten tons Capacity
For
TRUCKS AND TRACTORS

All Gears Always in Mesh



An Assurance of Dependable Service

COTTA TRANSMISSION COMPANY
814-818 South Main Street **ROCKFORD, ILLINOIS**

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GREASES (Continued)

CUP AND GEAR GREASES (Continued)

BISON—See Cataract Refining & Mfg. Co.

BLACK DIAMOND—See Sweet, Charles F.

BLIVEN & Carrington, 116 Broad St., New York, N. Y. "E. Z. Way."

BORNE, Scrymser Co., 80 South St., New York, N. Y. "Colonial," "Silex."

BUCK & Co., E. A., Worcester, Mass. "Powero."

BULL DOG—See Climax Western Oil Co.

CALYPSOL—See Cataract Refining & Mfg. Co.

CAROLENE—See Valley Oil Co.

CASCADE—See Cataract Refining & Mfg. Co.

CASSCO Bar-Metallic Packing Co., 8 S. Dearborn St., Chicago, Ill.

CATARACT Refining & Mfg. Co., Marine National Bank Bldg., Buffalo, N. Y. "Bison," "Calypsol," "Cascade."

CHAINOLENE Mfg. Co., 617-19 Fulton St., Chicago, Ill.

CHESTER Graphite Co., Chester Springs, Pa. "Hexagon."

CINCINNATI Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Nonfrixo."

CLARKSON & Ford Co., 55 Water St., New York, N. Y. "Banner."

CLIMAX—See Sweet, Charles F.

CLIMAX Western Oil Co., 2824 Tenth Ave., S., Minneapolis, Minn. "Bull Dog."

COLONIAL—See Borne, Scrymser Co.

COLUMBIA Refining Co., 90 West St., New York, N. Y. "K. A. C.", "Royal."

COMMERCIAL Lubricating Co., Meadow & Jackson Sts., Philadelphia, Pa. "Lubriko."

CONNECTICUT Oil Co., 549 S. Leonard St., Waterbury, Conn.

CONTINENTAL Asbestos Corp., 7-11 Summer St., Worcester, Mass. "Spedolene."

CONTINENTAL Oil Products Co., 1467 Michigan Ave., Chicago, Ill.

COOKS—See Albany Lubricating Co.

CRANE & Co., 91 Oliver St., Boston, Mass. "Eureka."

CRAWFORD Co., Wm. J., 14 Wood St., Pittsburg, Pa.

CREW Levick Co., Land Title Bldg., Philadelphia, Pa. "Perfection."

CROWN—See Kellogg & Co.

CURROLA—See Curry Bros. Oil Co.

CURRY Bros. Oil Co., 253-55 Franklin St., Boston, Mass. "Currola," "Superba."

DETROIT—See Zurn Co.

DIAMOND CROSS—See Auto Oil Co.

DIXON Crucible Co., Joseph, Jersey City, N. J.
(See page 253.)

DRAKE Oil Co., 99 E. Spring St., Titusville, Pa.

DUPLEX—See Enterprise Oil Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

E. Z. WAY—See Bliven & Carrington.

EAGLE Oil & Supply Co., Boston, Mass. "Eagleine."
(See page 827.)

EAGLEINE—See Eagle Oil & Supply Co.

EBONITE—See Oil City Oil & Grease Co.

ECONOMY—See Pennsylvania Lubricating Co.

EMCO—See Emery Mfg. Co.

EMERY Mfg. Co., Bradford, Pa. "Emco."

EMPIRE—See Richardson Lubricating Co.

ENERGINE Refining & Mfg. Co., The Arcade, Cleveland, O.

ENSIGN Refining Co., 10605 Quebec Ave., Cleveland, O.

ENTERPRISE Oil Co., 164 Chandler St., Buffalo, N. Y. "Duplex."

EUREKA—See Crane & Co.

EXCELSIOR—See Kellogg & Co.

EXCELSIOR—See Miller's Sons.

EXCELSIOR—See Mills Oil Co.

FAULTLESS—See Hawkeye Oil Co.

FIBROVISCOS—See Sheppard, W. S.

FISKE Bros. Refining Co., 24 State St., New York, N. Y. "Lubroleine."

FRANK Oil Co., 28 W. Spring St., Titusville, Pa.

FRANKLIN Oil Works, E. Atlantic Ave. Franklin, Pa.

FRAZER Lubricator Co., 3921 Normal Ave., Chicago, Ill.

FULCRUM Oil Co., Franklin, Pa.

GEARO—See American Oil Co.

GERMANIC—See Wood Co.

GOLD MEDAL—See Monarch Mfg. Co.

GRAND PRIX—See Alexander & Co.

GREAT Western Oil Co., 2855 E. 37th St. Cleveland, O.

GREDAG—See Acheson Oildag Co.

GREE-NO-CO—See Greenslade Oil Co.

GREEN SEAL—See Monarch Mfg. Co.

GREEN SEAL—See Phoenix Oil Co.

GREENSLADE Oil Co., 40 Jefferson Ave., Detroit, Mich. "Gree-no-co."

GREOIL—See Robinson & Son Co.

HAGGERTY Refining Co., 50 South St., New York, N. Y. "Thermo."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HARRIS Oil Co., A. W., 326 S. Water St., Providence, R. I.

HAVOLINE—See Indian Refining Co.

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HAWS, George A., 142-44 Front St., New York, N. Y. "Panhard."
(See page 353.)

HELMET—See Besly & Co.

HERCULES—See Media Grease Co.

HEXAGON—See Chester Graphite Co.

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

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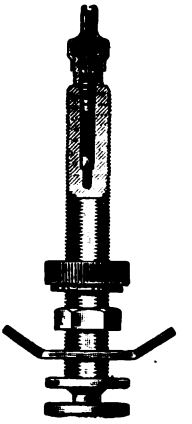

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GREASES (Continued)

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HOUGHTON & Co., E. F., 340 W. Somerset St., Philadelphia, Pa.

I-O-C—See Invader Oil Co.

I. X. L.—See Kramer Oil Co.

IDEAL—See Sheppard, W. S.

ILSLEY, Doubleday & Co., 229-31 Front St., New York, N. Y. "Autogrease."

IMPERIAL Oil Co., 3124 Locust St., St. Louis, Mo.

INDIAN Refining Co., 44 Whitehall St., New York, N. Y. "Havoline."

INTERSTATE Chemical Co., 12-20 Bayview Ave., Jersey City, N. J. "Key."

INVADER Oil Co., 80 Broad St., New York, N. Y. "I-O-C."
(See page 467.)

IRONSIDES Co., Wyandotte Bldg., Columbus, O. "Shield."
(See page 815.)

JONES & Bro., J., 429 Locust St., Philadelphia, Pa. "Balkan."

K. A. C.—See Columbia Refining Co.

KELLOGG & Co., E. H., 242-44 South St., New York, N. Y. "Crown." "Excelsior."

KELLY Graphite Mills, 534 W. 22d St., New York, N. Y.

KENCO—See Kendall Refining Co.

KENDALL Refining Co., Bradford, Pa. "Royal," "Kenco."

KEY—See Interstate Chemical Co.

KEYSTONE Lubricating Co., 21st & Clearfield Sts., Philadelphia, Pa.

KEYSTONE Oil & Mfg. Co., 111 N. Market St., Chicago, Ill.

KILNOYS—See Miller Co.

KRAMER Oil Co., W. J., 214-16 Reed St., Milwaukee, Wis. "I. X L."

LAYTON Park Oil & Soap Co., M. & M. Bank Bldg., Milwaukee, Wis.

LIBERTY BELL—See Bell Oil Co.

LION—See Moore Oil Co.

LOOS & Dilworth, 134 S. Front St., Philadelphia, Pa. "Pioneer."

LUBREX Mfg. Co., Pittsburgh, Pa.

LUBRIKO—See Commercial Lubricating Co.

LUBROLEINE—See Fiske Bros. Refining Co.

McLEAN-JONES Oil & Supply Co., 40 India Wharf, Boston, Mass. "Swastika."

MARATHON—See Weinberg & Co.

MARSHALL Oil Co., Marshalltown, Ia. "Moco," "Rex."

MASTER—See Pure Oil Co.

MEDIA Grease Co., Media, Pa. "Hercules."

MICAFLAKE—See U. S. Mica Mfg. Co.

MIDDLE States Oil Co., Engineers Bldg., Cleveland, O.

MILLER Co., Wm. P., 244-50 Green St., Brooklyn, N. Y. "American." "Kilnoys."

MILLER'S Sons, Wm. P., 298-302 Hancock St., Long Island City, N. Y. "Excelsior."

MILLERS Sons Co., A. D., Columbus & Preble Aves., Pittsburgh, Pa. "Perfection," "Admsco."

MILLS Oil Co., C. E., 263 Walton St., Syracuse, N. Y. "Excelsior."

MILWAUKEE Lubricants Co., 112 Huron St., Milwaukee, Wis.

MOBILUBRICANT—See Vacuum Oil Co.

MOCO—See Marshall Oil Co.

MONARCH Mfg. Co., Council Bluffs, Ia. "Gold Medal," "Green Seal."

MONOGRAM—See New York Lubricating Oil Co.

MOORE Oil Co., York St. & McLean Ave., Cincinnati, O. "Lion."

MOTOGREASE—See Vacuum Oil Co.

MOTOR Mica Mfg. Co., 1110 N. Clark St., Chicago, Ill.
(See page 823.)

MOTORLIGHT—See Petroleum Coke Co.

MOTORLUBE—See Tygert Co.

NAPOLEON—See Van Tilburg Oil Co.

NATIONAL Refining Co., Rose Bldg., Cleveland, O.

NATIONAL Oil & Supply Co., 180 Freylinghuysen Ave., Newark, N. J. "Viscos."

NEW York Lubricating Oil Co., New York, N. Y. "Monogram."

NEW York & New Jersey Lubricant Co., 165 Broadway, New York, N. Y. "Non-Fluid."

NOBETR—See Sawyer Oil Co.

NOBLE Refining Co., 706 Canal Rd., Cleveland, O.

NON-FLUID—See New York & New Jersey Lubricant Co.

NONFRIXO—See Cincinnati Oil Works Co.

NORTHWESTERN Chemical Co., Marietta, O.
(See pages 172 and 173.)

OIL City Oil & Grease Co., 365-77 Seneca St., Oil City, Pa. "Pensoil," "Ebonite."

OILZUM—See White & Bagley Co.

OTTOMO—See Pioneer Mfg. Co.

OWL—See Western Chemical Mfg. Co.

PALUBCO—See Pennsylvania Lubricating Co.

PANHARD—See Haws, Geo. A.

PARAGON Refining Co., 2935 Front St., Toledo, O. "Polar."

PARKER Refining Co., 1307 W. 11th St., Cleveland, O.

PATTERSON Lubricating Co., 114 Broad St., Boston, Mass.

PENN—See Pennsylvania Lubricating Co.

PENN Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa. "Primus."

PENNSYLVANIA Lubricating Co., 34th St. & A. V. Ry., Pittsburg, Pa. "Penn," "Sylvan," "Economy," "Palubco."

PENSOIL—See Oil City Oil & Grease Co.

PERFECTION—See Crew Levick Co.

PERFECTION—See Millers Sons Co.

PERFECTION—See Sawyer Oil Co.

PERFECTION—See Wood Co.

PERFECTO—See Young & Kimball.

PERRY Oil Co., 372 Central Ave., Pawtucket, R. I.

PETROLEUM Coke Co., Edgemont & Venango Sts., Philadelphia, Pa. "Motorlight."

PETROLEUM Products Co., 39th St. & B. & O. R. R., Pittsburgh, Pa. "Sound-Proof."

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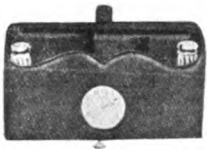

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PHOENIX Oil Co., 2554 W. Fifth St., Cleveland, O. "Green Seal."

PIGOT-SAYRE Co., 71-72 Front St., New York, N. Y. "Aurora."

PIONEER—See Loos & Dilworth.

PIONEER Mfg. Co., Harvard Ave. & E. 103d St., Cleveland, O. "Ottomo."

PLATT & Washburn Refining Co., 11 Broadway, New York, N. Y. "Veedol."

POLAR—See Paragon Refining Co.

POLARINE—See Standard Oil Co. of N. Y.

POWERO—See Buck & Co.

PRIMUS—See Penn Petroleum & Supply Co.

PURE Oil Co., First St. & 18th Ave., S., Minneapolis, Minn. "Puritan," "Master."

PURITAN—See Pure Oil Co.

PURITAN Oil Co., 1218 W. 70th St., Cleveland, O.

REX—See Marshall Oil Co.

RICHARDSON Lubricating Co., Quincy, Ill "Empire."

RIE-NIE—See Durkee-Atwood Co.

RIVERSIDE Oil Co., Benedum Trees Bldg., Pittsburg, Pa.

ROBINSON & Son Co., Wm. C., 32 South St., Baltimore, Md. "Greoil."

ROYAL—See Columbia Refining Co.

ROYAL—See Kendall Refining Co.

SAWYER Oil Co., Howard B., 62 Long Wharf, Boston, Mass. "Nobetr," "Perfection."

SHEPPARD, W. S., 21 Lawrence St., Newark, N. J. "Fibroviscos," "Ideal."

SHIELD—See Ironsides Co.

SILEX—See Borne, Scrymser Co.

SONNEBORN Sons, L., 262 Pearl St., New York, N. Y. "Amalie."

SOUND-PROOF—See Petroleum Products Co.

SPEARE'S Sons Co., Alden, 140 Sixth St., Boston, Mass.

SPEDOLENE—See Continental Asbestos Corp.

STANDARD Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Polarine."

SULLIVAN Oil Co., 413 Wells St., Chicago, Ill.

SUPERBA—See Curry Bros. Oil Co.

SUPERIOR Oil Co., Century Bldg., Cleveland, O.

SUTHERLAND & Co., P., 282 Milk St., Boston, Mass. "Velvet."

SWAN & Co., Alden S., 135 Front St., New York, N. Y. "Swanovia."

SWAN & Finch Co., 165 Broadway, New York, N. Y. "Atlas."
(See page 351.)

SWANOVIA—See Swan & Co.

SWASTIKA—See McLean-Jones Oil & Supply Co.

SWEET, Charles F., 247 State St., Hartford, Conn. "Climax," "Black Diamond."

SYLVAN—See Pennsylvania Lubricating Co.

TEXACO—See Texas Co.

TEXAS Co., 17 Battery Pl., New York, N. Y. "Texaco."

THERMO—See Haggerty Refining Co.

TOCO—See Tropical Oil Co.

TROJAN—See Van Tilburg Oil Co.

TROPICAL Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O. "Toco."

TULC—See Universal Lubricating Co.

TYGERT Co., E. A., 126 N. Front St., Philadelphia, Pa. "Motorlube."

UNION Petroleum Co., 135 S. Second St., Philadelphia, Pa.

U. S. Mica Mfg. Co., Lytton Bldg., Chicago, Ill. "Micaflake."

UNITED States Graphite Co., Saginaw, Mich.

UNIVERSAL—See Young & Kimball.

UNIVERSAL Lubricating Co., Schofield Bldg., Cleveland, O. "Tulc."

VACUUM Oil Co., Rochester, N. Y. "Mobilubricant," "Motogrease," "Autosponge."

VALLEY Oil Co., Century Bldg., Cleveland, O. "Carolene."

VALVOLINE Oil Co., 11 Broadway, New York, N. Y.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Napoleon," "Trojan," "Best."

VEEDOL—See Platt & Washburn Refining Co

VELVET—See Sutherland & Co.

VELVET—See Winne, Howard B.

VERACITY—See Warren Refining & Chemical Co.

VISCO Motor Oil Co., 2104 Superior Viaduct, Cleveland, O.

VISCOS—See National Oil & Supply Co.

VISCOSITY Oil Co., 1101-08 W. 37th St., Chicago, Ill.

WADHAMS Oil Co., Milwaukee, Wis. "Badger."

WARREN Refining & Chemical Co., Cleveland, O. "Veracity."

WAVERLY Oil Works Co., Pittsburg, Pa.
(See page 351.)

WEINBERG & Co., J. H., 128 Maiden Lane, New York, N. Y. "Marathon."

WESTERN Chemical Mfg. Co., 151 Sixth St., Milwaukee, Wis. "Owl."

WHITE & Bagley Co., Worcester, Mass. "Oilsum."
(See page 611.)

WHITMORE Mfg. Co., 38 Iron Ct., Cleveland, O.

WHIZ—See Hollingshead Co.

WINN, Wm. R., 148 Maiden Lane, New York, N. Y.

WINNE, Howard B., 714 W. Jackson Blvd., Chicago, Ill. "Velvet."

WINSLOW Lubricating Co., 1449-55 Niagara St., Buffalo, N. Y.

WOLVERINE Lubricants Co. of N. Y., 80 Broad St., New York, N. Y.

WONDER WORKER—See Hall-Thompson Co

WOOD Co., W. A., 373 Atlantic Ave., Boston, Mass. "Perfection," "Germanic."

YOUNG, Orlando W., 180 Sherman Ave., Newark, N. J.

YOUNG & Kimball, Frank L., 111 Purchase St., Boston, Mass. "Universal." "Perfecto."

ZURN Co., O. F., 2736-38 N. Broad St., Philadelphia, Pa. "Detroit."

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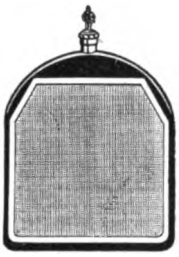

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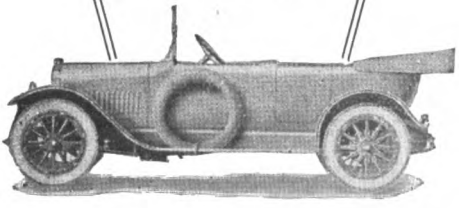

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GRIPS

PEDAL GRIPS

AUTO Pedal Pad Co., 794 Seventh Ave., New York, N. Y. "Perfection."

MATTSON Rubber Co., Lodi, N. J.
(See page 827.)

PERFECTION—See Auto Pedal Pad Co.

RIVES Mfg. Co., Geo. H., Woolworth Bldg., New York, N. Y.

THROTTLE AND SPARK LEVER GRIPS

AMERICAN Hard Rubber Co., 9 Mercer St., New York, N. Y.

LUZERNE Rubber Co., Trenton, N. J.

STOKES Rubber Co., Jos., Trenton, N. J.

GUARDS

HORN BULB GUARDS

ASCO—See N. Y. Wire & Spring Co.

N. Y. Wire & Spring Co., 586-88 Washington St., New York, N. Y. "Asco."
(See page 789.)

LEATHER MUD GUARDS AND FENDERS

McKINNON Dash Co., 252 Amherst St., Buffalo, N. Y.

PETERS & Herron Dash Co., Columbus, O.
(See page 617.)

METAL MUD GUARDS AND FENDERS

A-H Mfg. Co., 2076 E. 22d St., Cleveland, O.

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

AUTO Metal Co., 531 Worthington St., Springfield, Mass.
(See page 107.)

AUTO Radiator Mfg. Co., 764-66 W. Van Buren St., Chicago, Ill.
(See page 791.)

AUTOCRAFT—See Craftsmen Motor Corporation.

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

BUSH Mfg. Co., Hartford, Conn.
(See page 467.)

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

CORNWALL Mfg. Co., E. 128th St., & Penobscot Ave., Cleveland, O.
(See page 739.)

CRAFTSMEN Motor Corporation, 2815-19 S. Wabash Ave., Chicago, Ill. "Autocraft."
(See page 573.)

DETROIT Auto Specialty Co. 909-11 Greenwood Ave., Detroit, Mich.

FORSYTH Bros. Co., Chicago, Ill.
(See page 241.)

HALE & Kilburn Co., 18th St. & Glenwood Ave., Philadelphia, Pa.
(See page 109.)

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

ILLINOIS Auto Sheet Metal Works, 1712-14 Michigan Ave., Chicago, Ill.

JOHNSON'S Automobile Sheet Metal Works, W. N., 620-28 South J St., Richmond, Ind.

KELLS Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y.
(See page 261.)

KEYSTONE Sheet Metal Co., Ambridge, Pa

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco."
(See page 617.)

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MICHIGAN Crown Fender Co., 101 Cross St., Ypsilanti, Mich.
(See page 611.)

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MOLINE Pressed Steel Co., East Moline, Ill.

MULLINS Co., W. H., 182 Franklin St., Salem, O.

MURRAY Mfg. Co., J. W., 550-60 Clay Ave., Detroit, Mich.

PARAGON Auto-Parts Mfg. Co., 506 W. 53d St., New York, N. Y.

PERFEX Radiator Co., Racine, Wis.

SAGINAW Sheet Metal Works, Saginaw, Mich.

SARGEANT Mfg. Co., New & Summit Sts., Newark, N. J.

SHOTWELL-HOBART-JOHNSON Co., 712-22 Ontario Ave. N., Minneapolis, Minn.

SPRINGFIELD Body Co., Springfield, Mass.

TODD Mfg. Co., 820-24 Mary Pl., Minneapolis, Minn.

WILSON & Bowen, 1318 S. Main St., Los Angeles, Cal.

WISCONSIN Automobile Radiator Co., North Milwaukee, Wis.

WOOD MUD GUARDS AND FENDERS

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

HABERKORN & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

GUNS

GREASE GUNS

AGNER Co., Raymond C., Burlington, Wis. "Simplex."

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

AVERY Portable Lighting Co., 351 National Ave., Milwaukee, Wis.

B-LINE—See Randall-Faichney Co.

BELL Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.

BIG DANE—See Miller & Starr Co.

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BOE & CO., H. M., 2416 University Ave., S. E., Minneapolis, Minn.

BOYD & Richardson, Ashton, Ill.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BROWN Co., 218 Bellevue Ave., Syracuse, N. Y.

CARLYON Mfg. Co., 43 Eastham Ave., E., Cleveland, O.

DILLEY, A. J., Muir, Mich.

ECONO-LUB—See Middle States Oil Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill. "Gem," "Jumbo," "Giant."

EKERN Bros., Flandreau, S. Dak. (See page 783.)

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

GEM—See Edelmann & Co.

GENERATOR Valve Co., 294-96 Taaffe Pl., Brooklyn, N. Y. "James."

GIANT—See Edelmann & Co.

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y.

HANEY & Co., J. H., Hastings, Neb. "Rose."

HIPWELL Mfg. Co., 831-35 North Ave., W., Pittsburg, Pa. "Jumbo."

INTERNATIONAL Automobile Supply Co., 117 W. South Water St., Chicago, Ill.

JAMES—See Generator Valve Co.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. "Victor." (See pages 415 and 799.)

JUMBO—See Edelmann & Co.

JUMBO—See Hipwell Mfg. Co.

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

LACO—See Lubricating Accessories Co.

LITTLE GIANT—See Neiman Machine Wks.

LUBRICATING Accessories Co., Paterson, N. J. "Laco." (See page 611.)

MANN Corp., Kankakee, Ill.

MIDDLE States Oil Co., Engineers Bldg., Cleveland, O. "Econo-Lub."

MILLER & Starr Co., 250 Green St., Brooklyn, N. Y. "Big Dane."

NEIMAN Machine Works, Freeport, Ill. "Little Giant."

NOERA Mfg. Co., 21-97 Griggs St., Waterbury, Conn.

P. D. Q.—See Star Brass Works.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

POWERS Sales Co., Peoples Gas Bldg., Chicago, Ill.

RANDALL-FAICHNEY Co., 76 Atherton St., (Jamaica Plain), Boston Mass. "B-Line."

ROSE—See Haney & Co.

RUNYEN Mfg. Co., 50 Market Ave., Grand Rapids, Mich.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SIMPLEX—See Agner Co.

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo. "P. D. Q."

STRICKLER—See Powers Sales Co.

TOOMEY Grease Gun Co., Edmore, N. Dak.

TOWNSEND & Co., S. P., West Orange, N. J.

VICTOR—See Judd & Leland Mfg. Co.

WARREN & Anderson, 404 Boston Blk., Minneapolis, Minn. "Ekern."

WEAVER Mfg. Co., Springfield, Ill.

ZWALD, John J., Emporium, Pa.

OIL GUNS

AGNER Co., Raymond C., Burlington, Wis. "Simplex."

B-LINE—See Randall-Faichney Co.

BELL Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.

BLUE Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

BRIDGEPORT Brass Co., Bridgeport, Conn.

ESSEX Brass Co., G. B., 480-86 Franklin St. Detroit, Mich.

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y.

HANCOCK Mfg. Co., 770 Henry St., Charlotte Mich.

HANEY & Co., J. H., Hastings, Neb.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. (See pages 415 and 799.)

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

LACO—See Lubricating Accessories Co.

LUBRICATING Accessories Co., Paterson, N. J. "Laco." (See page 611.)

McRAE & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

NOERA Mfg. Co., 21-97 Griggs St., Waterbury, Conn.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

PREMIUM—See Blue Ribbon Mfg. Co.

RANDALL-FAICHNEY Co., 76 Atherton St., (Jamaica Plain), Boston, Mass. "B-Line."

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SIMPLEX—See Agner Co.

HAIR

UPHOLSTERY HAIR

ARMOUR Curled Hair Works, 31st Pl. & Benson Sts., Chicago, Ill.

BENTLEY Hair Co., Joseph, Methuen, Mass.

BURNHAM Mfg. Co., 210 River St., Burnham, Ill.

CUDAHY Curled Hair Works, 111 W. Monroe St., Chicago, Ill. (See page 263.)

DELANY & Co., 209 N. Third St., Philadelphia, Pa.

GORDON Bros., Pierce & Orthodox Sts. (Frankford), Philadelphia, Pa.

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CUDAHY Curled Hair

You Get Exactly What You Order

—when you order CUDAHY Curled Hair.

Because every grade we make is *standardized*, you are assured of getting the *same* quality each time you re-order. There is no variation.

Only through controlling our source of supply and conducting our own manufacturing under the supervision of curled hair experts is the CUDAHY standard of UNIFORMITY permanently maintained.

PROMPT DELIVERIES

is but one of the things we take pride in.

May We Quote You On Your Next Order?

Cudahy Curled Hair Works
111 WEST MONROE ST
CHICAGO

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HAIR (Continued)

UPHOLSTERY HAIR (Continued)

MITCHELL Co., P. R., Spring Grove & Harrison Aves., Cincinnati, O.

MORRIS & Co., U. S. Yards, Chicago, Ill.

SULZBERGER & Sons Co., Chicago, Ill. (See page 265.)

WILKENS Co., Wm., Frederick Ave. & Wilkens St., Baltimore, Md.

WOLL & Co., F. P., Church & Tacony Sts. (Frankford), Philadelphia, Pa.

WOLL & Sons Mfg. Co., Peter, Hancock & Berks Sts., Philadelphia, Pa.

HAMPERS

TOURING HAMPERS, BASKETS AND LUNCH BOXES

(See also Trunks, Automobile; also Stoves, Camp)

BURLINGTON Basket Co., 600 N. Main St., Burlington, Ia. "Hawkeye."

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O. (See page 121.)

HAWKEYE—See Burlington Basket Co.

KNICKERBOCKER Case Co., Fulton & Clinton Sts., Chicago, Ill. (See page 427.)

MOATS—See Prentiss-Wabers Mfg. Co.

PRENTISS-WABERS Mfg. Co., 20 Spring St., Grand Rapids, Wis. "Moats."

SEITZ, C., 275 W. 128th St., New York, N. Y.

OCHSNER & Sons Co., A., 1060 State St., New Haven, Conn.

PHOENIX Lock Works, 321-27 Third Ave., Newark, N. J.

REGAN & Kirwin Mfg. Co., 87 Shattuck St., Lowell, Mass.

ROSTAND Mfg. Co., Milford, Conn.

SARGEANT Mfg. Co., New & Summit Sts., Newark, N. J.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

STARTING CRANK HANDLES

AMERICAN Hard Rubber Co., 9 Mercer St., New York, N. Y.

AMERICAN Vulcanized Fibre Co., 585-95 Equitable Bldg., Wilmington, Del. (See page 225.)

CONTINENTAL Fibre Co., Newark, Del. (See page 171.)

DIAMOND State Fibre Co., Elsmere, Del.

HELLENBERG Co., J. B., Jefferson & Clark Sts., Coldwater, Mich.

LUZERNE Rubber Co., Trenton, N. J.

MECHANICAL Rubber Co., C. P. & Nickel Plate R. R., Cleveland, O.

STOKES Rubber Co., Jos., Trenton, N. J.

WILMINGTON Fibre Specialty Co., Wilmington, Del. (See page 225.)

HANDLES

DOOR HANDLES

AETNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

AMERICAN Brass Novelty Co., Grand Haven, Mich.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

BURNS & Bassick Co., Bridgeport, Conn. (See page 211.)

COWLES & Co., C., New Haven, Conn. (See page 257.)

DOUGLAS & Lomason Co., Detroit, Mich.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

ENTERPRISE Brass & Plating Co., 2838-44 Spring Grove Ave., Cincinnati, O.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

JONAH & George, Merrimac, Mass.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

MITCHELL Specialty Co., 2009 Market St., Philadelphia, Pa.

O'BRIEN Mfg. Co., Joseph F., 68 Park Pl., New York, N. Y. (See page 223.)

HANGERS

HAT HANGERS

(Clip for hanging hats on robe rails—See also Racks, Hat)

BUCKEYE—See Central Brass & Fixture Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

FERRO, M. C., 322 E. 29th Pl., Chicago, Ill. "P. & F."

P. & F.—See Ferro, M. C.

LICENSE HANGERS

(See Holders, License; also Numbers, License)

PRESSED STEEL STEP HANGERS

BOSSERT Co., Utica, N. Y. (See page 279.)

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

CRANDAL, Stone & Co., Binghamton, N. Y. (See page 469.)

CROSBY Co., Buffalo, N. Y. (See page 699.)

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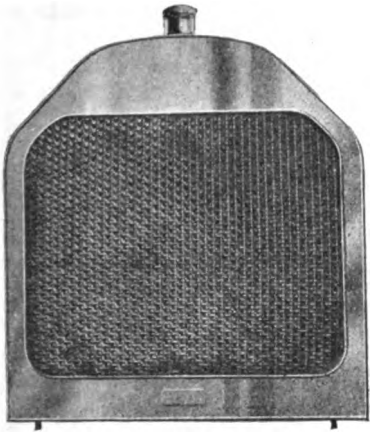
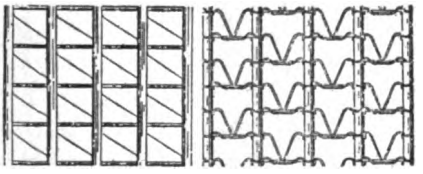
Guaranteed "RADIATORS OF QUALITY"





Square Front Bridge Fin

A glance at the construction of both types of our Radiators is convincing of unequalled durability and efficiency.

Our Bridge Fin type is endorsed by the leading Truck manufacturers.

We are the manufacturers of the Wright Patented Invisible Joint Hood. No rivets and no solder used.

WRIGHT COOLER & HOOD MFG. CO.
1253-55 Michigan Ave.
CHICAGO

Every Customer Demands Comfort

—when he buys a car. A good engine isn't enough. The seats must be restful and resilient, or the sale may be lost.

Sulzberger's STERILIZED Curled Hair

Automobile Upholstery De Luxe

—makes the easiest-riding cushions, that last the longest—at an economical figure.

Its durability and resiliency are unequalled. Holds curl and vitality permanently—"Stands up" under hard usage. In the long run it costs less than cheap substitutes.

Furnished in any grade or color for all purposes. Samples promptly sent on receipt of your specifications.

Standardize "Sulzberger's" on your cars, for satisfied customers and more sales.

SULZBERGER & SONS COMPANY

CHICAGO S&S **ILLINOIS**

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HANGERS (Continued)

PRESSED STEEL STEP HANGERS (Continued)

DETROIT Pressed Steel Co., 1800 Mt. Elliott Ave., Detroit, Mich.
(See page 281.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

HYDRAULIC Pressed Steel Co., 3180 E. 61st St., Cleveland, O.
(See pages 229 and 230.)

PARISH Mfg. Co., Reading, Pa.
(See page 709.)

ROCHESTER Pressed Steel Co., 85-87 Ford St.. Rochester, N. Y.

HASSOCKS

AUTOMOBILE HASSOCKS

(For Metal Foot Rests—See Rests, Foot)

CHICAGO Hassock Co., 1731 S. State St., Chicago, Ill.

HEADLIGHTS

ACETYLENE HEADLIGHTS

(See Lamps, Acetylene)

ELECTRIC HEADLIGHTS

(See also Lamps, Electric)

ADAMS-BAGNALL Electric Co., Cleveland, O.

E & J—See Edmunds & Jones Corp.

EDMUNDS & Jones Corp., Detroit, Mich. "E. & J."
(See page 321.)

GUIDE Motor Lamp Mfg. Co., Cleveland, O.
(See page 291.)

HALL Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich.

HAMMER Co., E. A., 1839 Euclid Ave., Cleveland, O.

HAWTHORNE Mfg. Co., 38 Spruce St., Bridgeport, Conn. "Old Sol."
(See page 307.)

HOFACKER Mfg. Co., 555 W. 42d St., New York, N. Y.
(See page 293.)

OLD SOL—See Hawthorne Mfg. Co.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

HEATERS

AUTOMOBILE HEATERS

(See also Gloves, Electrically Heated; also Wheels Heated Steering)

BAILEY Auto Heater Co., 228 W. Croton Ave., New Castle, Pa.

CHICAGO Flexible Shaft Co., 608 La Salle Ave., Chicago, Ill. "Clark."

CINCINNATI Auto Heater Mfg. Co., Liberty & Clay Sts., Cincinnati, O.

CLARK—See Chicago Flexible Shaft Co.

DUNCO—See Dunkirk Corp.

DUNKIRK Corp., Dunkirk, N. Y. "Dunco."

ELECTRIC Utilities Co., 100 Beaubien St., Detroit, Mich.

HILL Pump Valve Co., Archer Ave., Canal & 23d Sts., Chicago, Ill. "Utility."

K. P. Mfg. Co., 350 W. 54th St., New York, N. Y.

KONSRV Electric Co., 2041 E. Third St., Cleveland, O.

LEHMAN Bros., 10 Bond St., New York, N. Y. "Queen." "Star."

LYTLE Auto Heater Co., Memphis, Tenn.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radio."

OTTOFY Auto Heater Co., 2652 Locust St., St. Louis, Mo.

PEERLESS Radiator Co., Gibbs, Idaho.

PERFECTION-SPRING Service Co., 2002 E. 65th St., Cleveland, O.
(See page 267.)

QUEEN—See Lehman Bros.

RADIANT Auto Heater Co., Silver Creek, N. Y.

RADIO—See Milwaukee Auto Specialty Co.

RE-AC CO., 20 Mercer St., New Castle, Pa.

STAR—See Lehman Bros.

UTILITY—See Hill Pump Valve Co.

FEED WATER HEATERS

NATIONAL Pipe Bending Co., River & Lloyd Sts., New Haven, Conn.

OFELDT & Sons, F. W., Nyack, N. Y.

MIXTURE HEATERS

(For heating mixture in Carbureter or Manifold to facilitate starting)

CRONE, F. G., 334 Genesee St., Buffalo, N. Y.

IECO—See Interstate Electric Co.

INDUS—See Industrial Electric Mfg. Co.

INDUSTRIAL Electric Mfg. Co., 139 Beaubien St., Detroit, Mich. "Indus."

INTERSTATE Electric Co., Baronne & Perdido Sts., New Orleans, La. "Ieco."

MECHANICAL Utilities Co., 5 N. La Salle St., Chicago, Ill.

NATIONAL Automobile Equipment Co., Industrial Bldg., Indianapolis, Ind.

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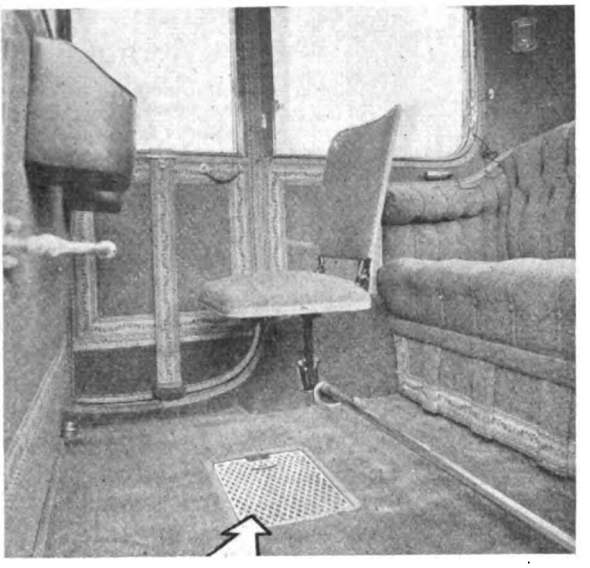

Next Winter

Each fall and winter a rapidly increasing number of car buyers are paying the additional price for closed car comfort.

Next winter practically every car maker will offer closed and convertible type bodies.

Several of these manufacturers will offer *complete* closed car comfort at but slight additional expense for

The Perfection Heater

PATENTED

Radiates Waste Exhaust Heat

A good closed or convertible body equipped with a Perfection Heater keeps cold air out and warm air in.

That's the *real comfort* car buyers are demanding.

The Perfection Heater is made in six models. Let us make a test installation for you *now*.

The Perfection-Spring Service Co.

2002 E. 65th Street, Cleveland, Ohio

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HEATERS (Continued)

MIXTURE HEATERS (Continued)

STAATS & Co., Geo., 252 Lorimer St., Brooklyn, N. Y. "Stalit."

STALIT—See Staats & Co.

SUBURBAN Lighting & Gas Engine Co., Summit & Lagrange Sts., Toledo, O.

RADIATOR HEATERS

(For keeping radiators from freezing)

CONSOLIDATED Car Heating Co., Singer Bldg., New York, N. Y.

KONSRV Electric Co., 2041 E. Third St., Cleveland, O.

NEVEROUT—See Rose Mfg. Co.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

HINGES

CABINET HINGES

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

SARGENT & Co., Water & Wallace Sts., New Haven, Conn.

STANLEY Works, New Britain, Conn. (See page 269.)

DOOR HINGES

AETNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

AMERICAN Brass Novelty Co., Grand Haven, Mich.

DOUGLAS & Lomason Co., Detroit, Mich.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

EUREKA—See Parsons Mfg. Co.

GEM—See Parsons Mfg. Co.

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis. (See page 479.)

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

KONIGSLOW Mfg. Co., Otto E., 35th St. & Perkins Ave., Cleveland, O.

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto." (See page 257.)

MONARCH—See Parsons Mfg. Co.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

OCHSNER & Sons Co., A., 1060 State St., New Haven, Conn.

PARSONS Mfg. Co., 21st & Fort Sts., Detroit, Mich. "Gem," "Monarch," "Eureka."

PRESTO—See Metal Specialties Mfg. Co.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

SOSS Mfg. Co., 435-43 Atlantic Ave., Brooklyn, N. Y.

STANLEY Works, New Britain, Conn. (See page 269.)

WAINWRIGHT & Son, W. W., 16th St. & Western Ave., Connersville, Ind.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

HOOD HINGES

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

BRONSON Co., Homer D., Beacon Falls, Conn.

HUNT & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill. (See page 255.)

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

WATERBURY Brass Goods Corp., 160 Washington Ave., Waterbury, Conn.

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

HOISTS

PORTABLE HOISTS

(See Cranes, Portable)

TRUCK BODY HOISTS

HYDRAULIC Hoist Mfg. Co., 172 W. Fifth St., St. Paul, Minn.

LITTLEFORD Bros., 453-57 E. Pearl St., Cincinnati, O.

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 249.)

WOOD Hydraulic Hoist & Body Co., 560 Franklin St., Detroit, Mich.

HOLDERS

BATTERY HOLDERS

(See also Boxes, Battery)

PATTERSON—See Stanley & Patterson.

STANLEY & Patterson, 23 Murray St., New York, N. Y. "Patterson."

BOUQUET HOLDERS

BALZER Co., Gus, 1777 Broadway, New York, N. Y.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

HAWKES & Co., T. G., Corning, N. Y.

INTERNATIONAL Silver Co., Meriden, Conn.

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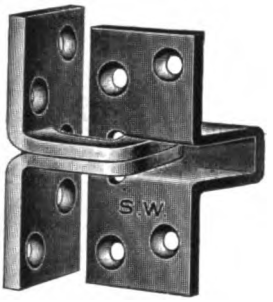
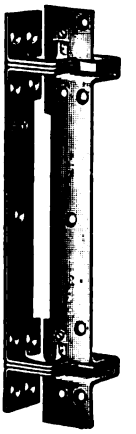
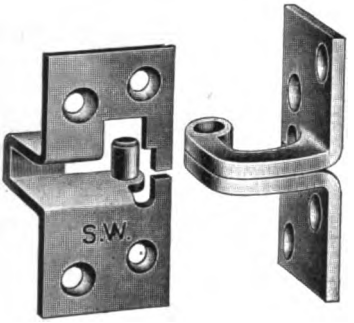
Stanley Auto Door Hinges



Made from our own special analysis Cold Rolled Steel. Standard sizes or special sizes and shapes made to order for every purpose.

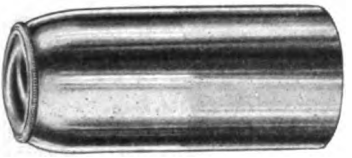




Send specifications and we will submit samples and prices.

Concealed Demountable, Straight, Curved, Blank and Finished, Deck and Tool Box Hinges

STANLEY S.W. WORKS
NEW BRITAIN CONNECTICUT



COWL LIGHT

L-258

Size of Body, 4¼"x2"—diameter of lens 1¼". Furnished in clear or frosted crystal, green or ruby colors. All metal of brass, any finish. Burns Standard G-6 Bulb.

Cut Glass Bouquet Holder

Anti-Slop Type

491/5/364.

Height of Vase, 6"—diameter at top, 2"

Designed for use in small closed cars where space is limited.
Made from genuine lead glass—an exceptional quality at a low price.
Plunger in bracket holds the vase rigid.
Base of bracket, 2" x ½".

MANUFACTURED BY METAL DEPT. OF

LIBERTY CUT GLASS WORKS

Main Office and Factory - EGG HARBOR CITY, N. J.

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HOLDERS (Continued)

BOUQUET HOLDERS (Continued)

LIBERTY Cut Glass Works, Egg Harbor City, N. J.
(See page 269.)

STEUBEN Glass Works, Corning, N. Y.

WATSON Co., Mechanics St., Attleboro, Mass.

FLAG, PENNANT AND EMBLEM HOLDERS

BON Tour Mfg. Co., Cobleskill, N. Y.

GRILLO—See Morris & Menkhaus Mfg. Co.

M. & M. Bracket Co., 29 E. Third St., Cincinnati, O.

MORRIS & Menkhaus Mfg. Co., 34 E. Court St., Cincinnati, O. "Grillo."

LICENSE HOLDERS

AUTOMOBILE License Indicator Co., Lewisburg, Tenn. "Perfection." "Standard."

BOSTON—See Phillips, Fordham.

BROOKS & Sons, M. S., Chester, Conn.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CORNELIUS-BROWNING Auto Co., 817-19 Jefferson Ave., Toledo, O. "Perfect."

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HALLADAY Co., L. P., Streator, Ill.

KISKI Novelty Co., Leechburg, Pa.

LEE Co., Wm. O., Port Huron, Mich.

M. & M. Bracket Co., 29 E. Third St., Cincinnati, O.

MASCO—See Milwaukee Auto Specialty Co.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MILWAUKEE Auto Engine & Supply Co., 29th St. & Mieneke Ave., Milwaukee, Wis.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

NEVEROUT—See Rose Mfg. Co.

PERFECT—See Cornelius-Browning Auto Co.

PERFECTION—See Automobile License Indicator Co.

PHILLIPS, Fordham (Allston), Boston, Mass. "Boston."

REED Co., 390 Main St., Mayfield, Cal.

REGAN & Kirwin Mfg. Co., 37 Shattuck St., Lowell, Mass.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

STAFFORD Auto Lamp & Number Co., 1475 Michigan Ave., Chicago, Ill.

STANDARD—See Automobile License Indicator Co.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

OIL CAN HOLDERS

BECCO—See Michigan Motor Specialties Co.

BUFFUM Tool Co., Louisiana, Mo.

HALLADAY Co., L. P., Streator, Ill. "Reliable."

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill. "Security."
(See page 735.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

RELIABLE—See Halladay Co.

SECURITY—See Mayo Mfg. Co.

SPIRO Mfg. Co., C., 68-72 E. 131st St., New York, N. Y. "Uniq."

UNIQ—See Spiro Mfg. Co.

UNIQUE Findings & Supply Co., Providence, R. I.
(See page 613.)

STARTING CRANK HOLDERS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BAILEY Co., R. B., 406 W. Pico St., Los Angeles, Cal.

CAMPBELL—See Perkins-Campbell Co.

CARTER Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

ECONOMY Stay Co., Jefferson City, Mo.

FEESER Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

G & K—See Graton & Knight Mfg. Co.

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K."
(See page 103.)

HAGER & Son, Chas., 1876 Broadway, New York, N. Y.

HANISCH Sons, R., 121-23 N. Halsted St., Chicago, Ill.

HAWES Storm Front Co., 14 N. Monroe St., Coldwater, Mich.

HOOVER Co., W. H., New Berlin, O.

KING Specialty Mfg. Co., 200 Washington St., Brookline, Mass.
(See page 599.)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

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Bull Dog Quality In Rubberized Mohairs and Serges Is Absolutely Waterproof

We are proud of the reputation of Bull Dog Quality and the trade generally acknowledges it as the standard—it is always waterproof—every yard is perfect.

Mutty's Special Auto Leathers and Rubber Cloths

are made in most attractive patterns and the prices are right.

Send for samples and prices

L. J. MUTTY CO.

BOSTON, MASS.

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HOLDERS (Continued)

STARTING CRANK HOLDERS (Continued)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 207.)

REINHOLD Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

SMITH & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.

SPECIALTY Harness Co., Dayton, Va.

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

STEVENS & Bro., A. A., 1234 Wabash Ave., Chicago, Ill.

SUPERIOR—See Feeser Co.

TIRE HOLDERS

(For carrying spare tires on cars)

AETNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ALDING—See Alsten & Goulding Co.

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

AMCO—See Chicago Electric Mfg. Co.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger." (See page 865.)

BADGER—See Auto Parts Mfg. Co.

BUCKEYE—See Central Brass & Fixture. Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

DETLOFF, A. J., 121 E. Lafayette Ave., Detroit, Mich.

DETROIT Tire Carrier Co., Detroit, Mich.

DOUGLAS & Lomason Co., Detroit, Mich.

E.-C. Sales Co., Postal Telegraph Bldg., Chicago, Ill.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn.

HALLADAY Co., L. P., Streator, Ill.

HERCULES—See Western Brass Mfg. Wks.

HIGHTON & Sons Co., Wm., Nashua, N. H.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

MASCO—See Milwaukee Auto Specialty Co.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

REESE Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

REGAN & Kirwin Mfg. Co., 37 Shattuck St., Lowell, Mass.

RIMOLOX Tire Carrier Co., 1501-21 E. Illinois St., Evansville, Ind.

SJOHOLM, N. P., 11 Westmoreland Pl., St. Louis, Mo.

SLY Mfg. Co., W. W., Cleveland, O.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

SUNDERLAND Mfg. Co., 61 E. 24th St., Chicago, Ill.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "Hercules." (See page 817.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

TOP HOLDERS

AUTO Specialties Mfg. Co., Henderson & Norton Aves., Joliet, Ill. "Bair." (See page 273.)

BAIR—See Auto Specialties Mfg. Co.

DETROIT Tire Carrier Co., Detroit, Mich.

GILLIAM Mfg. Co., Canton, O. "Ideal," "Jiffy."

IDEAL—See Gilliam Mfg. Co.

JIFFY—See Gilliam Mfg. Co.

ROCK Island Mfg. Co., 14th Ave. & First St., Rock Island, Ill. (See page 273.)

SHARRER Patent Top Co., 245 W. 55th St., New York, N. Y.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WATCH HOLDERS

(See also Clocks, Dashboard)

BURLEIGH, Geo. K., Penacook, N. H.

CALDWELL, Robinson & Vandemark, 74 Cortlandt St., New York, N. Y. "Readwell."

COWLES & Co., C., New Haven, Conn. (See page 257.)

ECONOMIC—See Jay & Dee Specialty Co.

JAY & Dee Specialty Co., 41 Park Row, New York, N. Y. "Economic."

MEISER & Co., G. H., 6823 S. Chicago Ave., Chicago, Ill. "Quick Action."

NOJAR—See Pennsylvania Rubber Co.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

OSBORNE & Stephenson Mfg. Co., Plainville, Conn. (See page 709.)

PENNSYLVANIA Rubber Co., Jeannette, Pa. "Nojar."

QUICK ACTION—See Meiser & Co.

READWELL—See Caldwell, Robinson & Vandemark.

Complete Index to Classification appears on Pages 8 to 27.

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SPECIAL MODEL FOR FORD CARS

Patented in Germany, France, Great Britain and Canada. U. S. Patent Pending

THE PITTER
MULTIBLADE FAN
3 Blades in One

MANUFACTURERS: The service of the cars you turn out, depends largely upon the action of their motors.

THE PITTER MULTIBLADE FAN draws air from the Periphery, forcing air through every square inch of the radiator surface instead of only at the center.

"With the same current consumption these blades move about 30% to 40% more air than a flat blade of the same diameter."

General Electric Company, Ltd., London.

DEALERS:

Write for particulars of our special Ford Fan, PREVENTS FORD MOTORS OVER-HEATING.

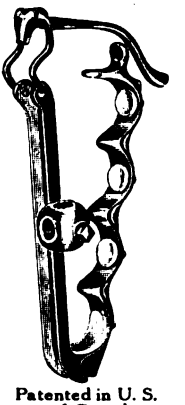
THE PITTER FAN COMPANY,

Gen. Offices: 1842 Peoples Gas Bldg., Chicago.

Factory: Elgin, Ill.

BAIR
Bow-Separating Top-Holders

A clean-cut mechanical device that divides the weight of the top. When the BAIR HOLDERS are locked on the bows the entire top is held rigid—as in a vise — preventing rattling, spread or broken bows. Models for all types of tops, including special forms for use with one-man tops of all different makes



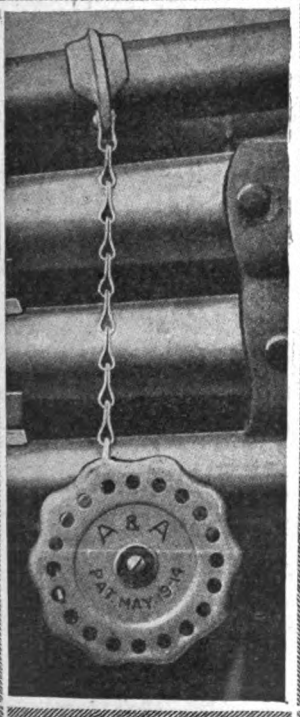
Patented in U. S. and Canada

"THEY HOLD"

STANDARD FACTORY EQUIPMENT on over 60 well-known makes of automobiles. Let us quote you prices.

AUTO SPECIALTIES MFG. CO.

Cor. Henderson and Norton Aves., JOLIET, ILL.



It Takes Two Minutes to Install

and they sell on sight.

The Adams Automobile Top Holder

is the only device on the market which will hold the bows rigidly, can be easily released in a second or two, fits every car and is always ready. Nothing to get out of order.

The chain is the best steel, sherardized and finished in black enamel. It has a tensile strength of 465 pounds—four times as strong as a heavy strap. Can be drawn as tight as a cable.

Agents Wanted

List price, $2.00 per pair.

Thoroughly protected by patents

ROCK ISLAND MFG. CO.

14th Avenue and 1st Street

Rock Island Illinois

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HOLDERS (Continued)

WATCH HOLDERS (Continued)

SIMPLEX—See Sterling Mfg. Co.

SNAP—See Wardway Sales Co.

STERLING Mfg. Co., Staunton, Va. "Simplex."

VOSS Auto Watch Co., 310 Second St., Des Moines, Ia.

WARDWAY Sales Co., 619 Pawtucket Ave., Pawtucket, R. I. "Snap."

HOODS

MOTOR HOODS

A-H Mfg. Co., 2076 E. 22d St., Cleveland, O.

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

AUTO Radiator Mfg. Co., 764-66 W. Van Buren St., Chicago, Ill. (See page 791.)

AUTOCRAFT—See Craftsmen Motor Corporation.

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

BUSH Mfg. Co., Hartford, Conn. (See page 467.)

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

CORNWALL Mfg. Co., E 128th St. & Penobscot Ave., Cleveland, O. (See page 739.)

CRAFTSMEN Motor Corporation, 2815-19 S. Wabash Ave., Chicago, Ill. "Autocraft." (See page 573.)

DETROIT Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

FORSYTH Bros. Co., Chicago, Ill. (See page 241.)

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis. (See page 479.)

GIER Pressed Steel Co., Lansing, Mich. (See page 787.)

HAYES Mfg. Co., 513 Maybury Grand Ave., Detroit, Mich.

ILLINOIS Auto Sheet Metal Works, 1712-14 Michigan Ave., Chicago, Ill.

JOHNSON'S Automobile Sheet Metal Works, W. N., 620-28 South J St., Richmond, Ind.

KELLS Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 261.)

KEYSTONE Sheet Metal Co., Ambridge, Pa.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 617.)

LONG Mfg. Co., Detroit, Mich. (See page 421.)

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

MOLINE Pressed Steel Co., East Moline, Ill.

MURRAY Mfg. Co., J. W., 550-60 Clay Ave., Detroit, Mich.

PARAGON Auto-Parts Mfg. Co., 506 W. 53d St., New York, N. Y.

PERFEX Radiator Co., Racine, Wis.

R. & H. Sheet Metal Co., 109 Center Ave., Abington, Mass.

SAGINAW Sheet Metal Works, Saginaw, Mich.

SARGEANT Mfg. Co., New & Summit Sts., Newark, N. J.

SHOTWELL-HOBART-JOHNSON Co., 712-22 Ontario Ave., N., Minneapolis, Minn.

SPRINGFIELD Body Co., Springfield, Mass.

SVENSGAARD Sales Corp., Harry, 214 Jefferson Ave., Detroit, Mich. (See page 615.)

TODD Mfg. Co., 820-24 Mary Pl., Minneapolis, Minn.

WISCONSIN Automobile Radiator Co., North Milwaukee, Wis.

WRIGHT Cooler & Hood Mfg. Co., 1253-55 S. Michigan Ave., Chicago, Ill. (See page 265.)

HOOKS

SAFETY TOW HOOKS

IDEAL—See Reinhold Co.

REINOLD Co., John J., Marietta, Pa. "Ideal."

SNAP HOOKS

ANCHOR—See North & Judd Mfg. Co.

COVERT Mfg. Co., Troy, N. Y.

NORTH & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 835.)

SARGENT & Co., Water & Wallace Sts., New Haven, Conn.

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WILCOX, Crittenden & Co., 83 Main St., Middletown, Conn.

HORNS

BULB HORNS

NONPAREIL Horn Mfg. Co., 73-75 Wooster St., New York, N. Y.

NOVELTY Mfg. Co., 125 Maple St., Waterbury, Conn.

RILEY-KLOTZ Mfg. Co., 17 Mulberry St., Newark, N. J.

STANDARD Metal Mfg. Co., Newark, N. J. (See page 277.)

ELECTRIC HORNS AND HORN BLOWERS

ADAMS-BAGNALL Electric Co., Cleveland, O.

AMERICAN Electric Co., State & 64th Sts., Chicago, Ill. "Samson," "Victor."

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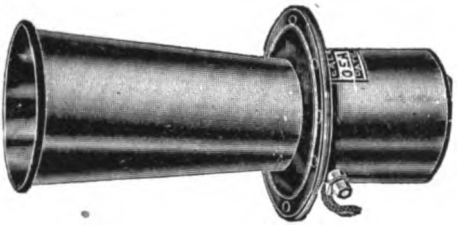
EACO HORNS

TYPE D.

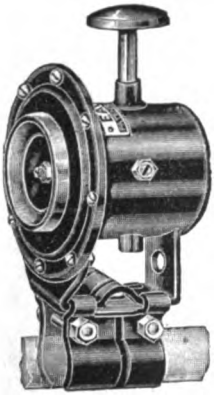


Motor-Driven. The best proposition for Automobile Manufacturers' Equipment. The best horn at the lowest price.

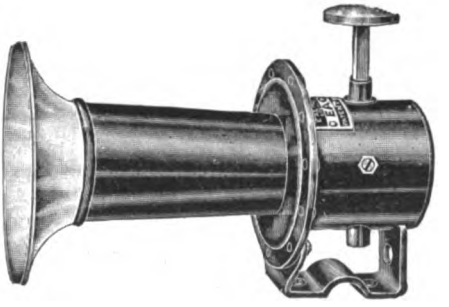
Hand Horns for Every Purpose

Our guarantee—prompt deliveries—goods up to sample—and a price 50% lower than you are now paying for horns of the same quality.

TYPE B.



TYPE A.



E. A. LABORATORIES, Inc.

54-82 BROADWAY BROOKLYN, N. Y.

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HORNS (Continued)

ELECTRIC HORNS AND HORN BLOWERS (Continued)

APOLLO—See Automobile Supply Mfg. Co.

AUTO PHONE—See Hipwell Mfg. Co.

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y. "Newtone," "Apollo."

BENJAMIN Electric Mfg. Co., 120 S. Sangamon St., Chicago, Ill.

CLERO—See Fitzgerald Mfg. Co.

DUPLEX Electric Mfg. Co., Pittsburgh, Pa. "Safeguard."

E. A. Laboratories, 54-82 Broadway, Brooklyn, N. Y.
(See page 275.)

ECONOMY—See Premier Electric Co.

ELECTRIC Spark Appliance Co., 140-62 Imlay St., Brooklyn, N. Y. "Olympic."
(See page 695.)

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Clero."
(See page 685.)

GARFORD Mfg. Co., Elyria, O. "Tuto," "Tutoette," "Rexo."
(See page 753.)

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco."
(See page 675.)

HIPWELL Mfg. Co., 331-35 North Ave., W. Pittsburg, Pa. "Auto Phone."

HOLTZER-CABOT Electric Co., Roxbury, Mass. "Reacto."

INTER-STATE Machine Co., Rochester, N. Y. "Sterling."

KAYCEE—See Nonpareil Horn Mfg. Co.

KLAXET—See Lovell-McConnell Mfg. Co.

KLAXON—See Lovell-McConnell Mfg. Co.

KLAXONET—See Lovell-McConnell Mfg. Co.

LOVELL-McCONNELL Mfg. Co., Newark, N. J. "Klaxon," "Klaxonet," "Klaxet."
(See page 281.)

MINERVA Hardware Mfg. Co., Minerva, O.

NEWTONE—See Automobile Supply Mfg. Co.

NONPAREIL Horn Mfg. Co., 73-75 Wooster St., New York, N. Y. "Kaycee."

O'BRIEN Electrophone Co., Hallowell, Me.

OLYMPIC—See Electric Spark Appliance Co.

PIEL Co., G., 13th St. & Boulevard, Long Island City, N. Y.

PREMIER Electric Co., 4053 Ravenswood Ave., Chicago, Ill. "Economy."
(See page 559.)

REACTO—See Holtzer-Cabot Electric Co.

REXO—See Garford Mfg. Co.

RUSSELL Electric Co., Danbury, Conn. "Saxon,"

SAFEGUARD—See Duplex Electric Mfg. Co.

SAMSON—See American Electric Co.

SAXON—See Russell Electric Co.

SIRENO Co., 18-20 Rose St., New York, N. Y.

SPARKS-WITHINGTON Co., Jackson, Mich. "Sparton."

SPARTON—See Sparks-Withington Co.

STANDARD Metal Mfg. Co., Newark, N. J.
(See page 277.)

STERLING—See Inter-State Machine Co.

TURNER Electric Supply Co., 18-20 S. 20th St., Birmingham, Ala.

TUTO—See Garford Mfg. Co.

TUTOETTE—See Garford Mfg. Co.

VICTOR—See American Electric Co.

WARNER Electric Co., Walnut & 20th Sts., Muncie, Ind.

EXHAUST HORNS

(Tube Horns or Chimes and Whistles)

AERMORE—See Fulton Co.

AMCO—See Chicago Electric Mfg. Co.

AMERICAN—See Clark, Alfred H.

AUTOCHIME—See Gray-Hawley Mfg. Co.

BARCO Brass & Joint Co., 212-22 W. Illinois St., Chicago, Ill.

BIG Four Horn Co., Watseka, Ill.

BUELL Mfg. Co., 1806 S. Michigan Blvd., Chicago, Ill.
(See page 791.)

BULLOCK Engine Co., 143 N. Wabash Ave., Chicago, Ill. "Irish."

CAMPBELL Mfg. Co., 3715 Wentworth Ave., Chicago, Ill. "Harkaway."

CHICAGO Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Amco."

CLARK, Alfred H., 1307 Howard Ave., Bridgeport, Conn. "American."

CLIMAX Electric Works, New Salem, Mass.

COMING Mfg. Co., Railway Exchange Bldg., Chicago, Ill. "Trinity."

EMPIRE—See S. B. R. Specialty Co.

FULTON Co., 708-10 National Ave., Milwaukee, Wis. "Aermore."
(See page 695.)

GABRIEL Mfg. Co., 1407 40th St., N. E., Cleveland, O.

GRAY-HAWLEY Mfg. Co., 987-43 Jefferson Ave., Detroit, Mich. "Autochime."

HARKAWAY—See Campbell Mfg. Co.

HOWLER—See Pioneer Lamp Co.

HUSK—See Western Brass Mfg. Works.

INTERNATIONAL Automobile Supply Co., 117 W. South Water St., Chicago, Ill. "Victor."

IRISH—See Bullock Engine Co.

JERICHO—See Randall-Faichney Co.

JUBILEE—See Randall-Faichney Co.

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo.
(See page 747.)

NIGHTINGALE—See Riley-Klotz Mfg. Co.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill. "Howler."

RANDALL-FAICHNEY Co., 76 Atherton St., (Jamaica Plain), Boston, Mass. "Jericho," "Jubilee."

RILEY-KLOTZ Mfg. Co., 17 Mulberry St., Newark, N. J. "Nightingale."

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Empire."

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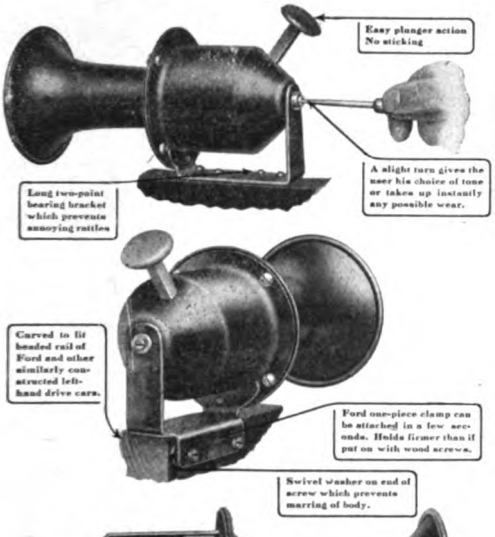

The STANDARD SIGNAL has many new and exclusive features, the value of which cannot be overestimated, and which places it in a class by itself.

A micrometer tone and wear adjusting-screw conveniently located makes it possible to obtain instantly an adjustment as fine as one-half thousandth part of an inch, which positively assures a perfect adjustment to the crudest novice even whilst the car is in motion.

This feature is of the utmost importance; it enables the user to obtain his own choice of tone; a long, medium or short blast. It enables him to take up instantly any possible wear, thereby maintaining the desired tone indefinitely. It prevents annoying demands upon the dealer for adjustments or repairs, thereby giving satisfaction to both dealer and user.

The STANDARD can be operated with one finger as easily as an electric horn owing to its perfect plunger action.

The STANDARD has an extra-long two-point bearing bracket, which positively prevents annoying rattles. This bracket is securely fastened to the horn by ONLY ONE conveniently located screw, by means of which the horn can be attached to the car in six different positions.

The STANDARD has a handsome finish consisting of *baked* black enamel, with nickel trimmings; its construction is simplicity itself and could not be better at any price; IT IS POSITIVELY GUARANTEED TO OUTWEAR ANY CAR TO WHICH IT MAY BE ATTACHED.

Horns intended for Fords and other similarly constructed cars are furnished with a special clamp bracket without extra charge, by means of which they can be attached in half a minute and without boring holes or marring the body of the car.

DEALERS:

By cutting out jobbers and commission salesmen, we are able to offer you unusually attractive discounts. You buy direct from the manufacturers at a lower price than what you now pay for horns of inferior construction.

Write today.

LIST PRICE $3.50

The Standard Auto Horn

SOMERVILLE, MASS.

We make various styles of horns other than those catalogued here and are large producers of Brass and Steel flexible tubing and manufacturers of sheet metal specialties, which we make to conform to your blue prints and specifications.

STANDARD Horns are guaranteed without restriction. The mechanical parts are strong, simple, and will, with proper use, last indefinitely. Our reputation is back of our product and will be jealously guarded.

These horns are packed one in a carton box with label. The prices are list, F.O.B. Newark.

STANDARD HAND HORN. Auto Type 10" long, 10" from top of handle to end of bracket. Weight 2½ lbs. complete. Black enamel finish, baked on. Bracket is adjustable for side as well as bottom.

Price $3.50

STANDARD HAND HORN, Motorcycle Type. 4½" long, 8½" from top of handle to bottom of bracket, 4½" bell. Bracket to clamp ⅞" or 1" rod very tight; weight 2 lbs. Black enameled finish baked on. **Price $3.50**

Standard Metal Mfg. Co., Newark, N. J.

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HORNS (Continued)

EXHAUST HORNS (Continued)

SCREAM Sales Co., 2724 Michigan Ave., Chicago, Ill.

STAR Brass Works, 2623 Mc Gee Ave., Kansas City, Mo.

TRINITY—See Coming Mfg. Co.

VICTOR—See International Automobile Supply Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "Husk."
(See page 817.)

MECHANICAL HORNS

A-K—See Angsten-Koch Co.

A. W. T.—See American Watch Tool Co.

AMERICAN Electric Co., State & 64th Sts., Chicago, Ill. "Samson-Tiger."

AMERICAN Watch Tool Co., Elm St., Waltham, Mass. "A. W. T."

ANGSTEN-KOCH Co., 215-19 Englewood Ave., Chicago, Ill. "A-K."

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y. "Motophone."

CLERO—See Fitzgerald Mfg. Co.

DUPLEX Electric Mfg. Co., Pittsburg, Pa. "Safeguard."

E. A. Laboratories, 54-82 Broadway, Brooklyn, N. Y.
(See page 275.)

ELECTRIC Spark Appliance Co., 140-62 Imlay St., Brooklyn, N. Y. "Olympic."
(See page 695.)

EVERGOOD—See Grossman Mfg. Co.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Clero."
(See page 685.)

GARFORD Mfg. Co., Elyria, O.
(See page 753.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "Evergood."
(See page 829.)

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco."
(See page 675.)

KLAXON—See Lovell-McConnell Mfg. Co.

KLAXONET—See Lovell-McConnell Mfg. Co.

LOVELL-McCONNELL Mfg. Co., Newark, N. J. "Klaxon," "Klaxonet."
(See page 281.)

M-L—See Miller-Lovatt Co.

MILLER-LOVATT Co., Weatherly, Pa. "M-L."

MOTOPHONE—See Automobile Supply Mfg. Co.

MOTOR Appurtenances Co., 1779 Broadway, New York, N. Y. "Wondertone."

NONPAREIL Horn Mfg. Co., 73-75 Wooster St., New York, N. Y. "Pilot," "Noxal."

NOXAL—See Nonpareil Horn Mfg. Co.

OLYMPIC—See Electric Spark Appliance Co.

PEERLESS Auto Horn Manufacturers, 311-30 N. Dearborn St., Chicago, Ill.

PIEL Co., G., 13th St. & Boulevard, Long Island City, N. Y.

PILOT—See Nonpareil Horn Mfg. Co.

S-C—See Sears-Cross Co.

SAFEGUARD—See Duplex Electric Mfg. Co.

SAMSON-TIGER—See American Electric Co.

SEARS-CROSS Co., Bush Terminal, Brooklyn, N. Y. "S-C," "Thunder."
(See page 465.)

SEISS Mfg. Co., 453 Dorr St., Toledo, O.
(See page 281.)

SERVICE Motor Supply Co., 640 Washington Blvd., Chicago, Ill.

SPARKS-WITHINGTON Co., Jackson, Mich. "Sparton-Echo."

SPARTON-ECHO—See Sparks-Withington Co.

STANDARD Auto Horn, Somerville, Mass.
(See page 277.)

STANDARD Metal Mfg. Co., Newark, N. J.
(See page 277.)

STEWART-WARNER Speedometer Corp., Chicago, Ill.
(See page 461.)

TALKING Horn Co., 18 Harrison St., Middletown, N. Y.

THUNDER—See Sears-Cross Co.

WONDERTONE—See Motor Appurtenances Co.

SIREN HORNS

INTER-STATE Machine Co., Rochester, N. Y. "Sterling."

O'BRIEN Electrophone Co., Hallowell, Me.

SIRENO Co., 18-20 Rose St., New York, N. Y.

STERLING—See Inter-State Machine Co.

HOSE

RUBBER HOSE

ACME Rubber Mfg. Co., Trenton, N. J.

BOSTON Belting Co., 84 Linden Park St., Boston, Mass.

BOSTON Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass.

BOWERS Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

CINCINNATI Rubber Mfg. Co., Cincinnati, O. "Norka."
(See page 763.)

CLEVELAND—See Mechanical Rubber Co.

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
(See page 685.)

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ESSEX Rubber Co., Trenton, N. J.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

GOODRICH Co., B. F., Akron, O.

HAMILTON Rubber Mfg. Co, Trenton, N. J.
(See page 505.)

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind.
(See page 789.)

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BOSSERT

Our production facilities are always adequate for any demand. Our plant and equipment is prepared for the prompt filling and delivery of your orders according to the established traditions of

THE BOSSERT WAY

which insures the quality of material, the accuracy of measurements and the skilled workmanship which have given us undisputed prestige as the Foremost American Manufacturers of

Pressed Steel Metal Parts for Motor Cars

We make more than 200 pressed steel metal parts. Among them are Axle Housings, Brake Drums, Hub Caps and Flanges, Ball Cups and Retainers, Step Hangers, Running Boards, Torque Arms, Engine Pans, Wire Wheel Hubs, Clutch Cones and Discs.

For Commercial Cars

We can manufacture Pressed Steel Parts which can be advantageously used in place of castings; giving better results and lighter weight without sacrificing strength.

Deliveries will be made on the day promised.

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HOSE (Continued)

RUBBER HOSE (Continued)

HOME Tire Co., Trenton, N. J.

J. E.—See Jackson-Eno Rubber Co.

JACKSON-ENO Rubber Co., 1010 S. Main St., Los Angeles, Cal. "J. E."

MANHATTAN Rubber Mfg. Co., Passaic, N. J.

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill. "Usco."

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O. "Cleveland."

MILFORD Rubber Works, Milford, Ill.

MINERALIZED Rubber Co., 165 Chambers St., New York, N. Y.

NATIONAL India Rubber Co., Bristol, R. I.

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

NEW York Belting & Packing Co., 91 Chambers St., New York, N. Y.

NORKA—See Cincinnati Rubber Mfg. Co.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

QUAKER City Rubber Co., Philadelphia, Pa.
(See page 839.)

REPUBLIC Rubber Co., Youngstown, O.

THERMOID Rubber Co., Trenton, N. J.
(See pages 81 and 289.)

USCO—See Mechanical Rubber Co.

VITALIC—See Continental Rubber Works.

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

WHITEHEAD Bros. Rubber Co., Trenton, N. J.

WOVEN Steel Hose & Rubber Co., Trenton, N. J.
(See page 829.)

HOUSINGS

PRESSED STEEL AXLE HOUSINGS

BOSSERT Co., Utica, N. Y.
(See page 279.)

CROSBY Co., Buffalo, N. Y.
(See page 699.)

DETROIT Pressed Steel Co., 1800 Mt. Elliott Ave., Detroit, Mich.
(See page 281.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

GIER Pressed Steel Co., Lansing, Mich.
(See page 787.)

HALE & Kilburn Co., 18th St. & Glenwood Ave., Philadelphia, Pa.
(See page 109.)

PARISH Mfg. Co., Reading, Pa.
(See page 709.)

SMITH Co., A. O., Milwaukee, Wis.
(See page 481.)

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

HUBS

WHEEL HUBS

AMERICAN Ball-Bearing Co., Cleveland, O.
(See page 73.)

AMERICAN Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.

BOSSERT Co., Utica, N. Y.
(See page 279.)

CROSBY Co., Buffalo, N. Y.
(See page 699.)

JACKSON Drop Forging Co., Jackson, Mich.

KELSEY Wheel Co., Detroit, Mich.
(See page 569.)

MOTT Wheel Works, Utica, N. Y.
(See page 497.)

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

TIMKEN-DETROIT Axle Co., Detroit, Mich.

WALKER-WEISS Axle Co., St. John St. & Hamilton Ave., Flint, Mich.

WESTON-MOTT Co., Flint, Mich.
(See page 463.)

HYDROMETERS

TESTING HYDROMETERS

(For testing Battery Electrolyte, Gasoline, etc.)

AMERICAN Thermo Ware Co., 16 Warren St., New York, N. Y. (Importers.) "Autocrat."

AUTOCRAT—See American Thermo Ware Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

FREEZOMETER—See Taylor Instrument Cos.

GENCO—See General Scientific Equipment Co.

GENERAL Scientific Equipment Co., 2720 W. Lehigh Ave., Philadelphia, Pa. "Genco."
(See page 787.)

QUEEN-GRAY Co., 616-18 Chestnut St., Philadelphia, Pa.

SIMPLEX Hydrometer Co., 314-20 Market St., Newark, N. J.

STORAGE Battery Supply Co., 239 E. 27th St., New York, N. Y.

TAGLIABUE Mfg. Co., C. J., Bush Terminal Bldg., Brooklyn, N. Y.

TAYLOR Instrument Cos., 95 Ames St., Rochester, N. Y. "Freezometer."

WEINHAGEN, H., 159-65 Leonard St., New York, N. Y.

WEISS & Son, Albert A., 572 Gates Ave., Brooklyn, N. Y.

INDICATORS

AUTOMOBILE SPEED INDICATORS

(See Speedometers)

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NONE TOO LARGE—NONE TOO SMALL

RUNNING BOARDS—STEP HANGERS
HEAVY STAMPINGS

SEND US YOUR BLUE PRINTS for Estimates

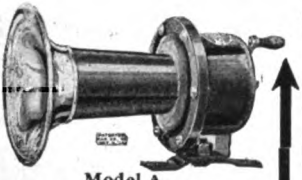
"QUALITY FIRST—SERVICE ALWAYS"

DETROIT PRESSED STEEL CO.

1800 MT. ELLIOTT AVE., DETROIT

SEISS

$4.00



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DOUBLE ACTING MECHANICAL HORN

Operated by touch of hand—turning either right or left—for short, low or sharp blast—or for long continuous sound same as a motor-driven Horn to demand attention and right of way.

Guaranteed for 10 Years

Positive in action—no ratchets—no spring pressure to go against—simplicity—nothing to get out of order.

Model M

$3.75

SEISS Motorcycle Horn is identically the same as the Automobile Horn except having shorter projector and is furnished with Universal Bracket for attaching to frame or handle-bar tube.

Write for Literature

Seiss Mfg. Co. 453 Dorr Street Toledo, Ohio

FOUR of the twenty-four types of

Klaxons

KLAXON Type L $20.

U. H. KLAXON $6.

U. H. KLAXON $12.

HAND KLAXON $4.

EACH has the famous Klaxon note; the Klaxon guarantee of *permanent* satisfaction. Is finished in smart "Klaxon Black."

LOVELL-McCONNELL MFG. COMPANY
Makers of the "KLAXON" Newark, N. J.

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INDICATORS (Continued)

DISTANCE OR MILEAGE INDICATORS

(See Meters, Distance)

GRADE INDICATORS

(See Meters, Grade)

SPARK INDICATORS

(See Gaps, Spark)

TAIL LIGHT INDICATORS

(Device to show when tail light goes out.)

CAMPBELL Mfg. Co., 3715 Wentworth Ave., Chicago, Ill. "Tell-Tale."

STEARNS Co., E. T., 104 School St., (Belmont Station), Boston, Mass.

TELL-TALE—See Campbell Mfg. Co.

INFLATORS

TIRE INFLATORS

(See Pumps; also Tanks)

INJECTORS

BOILER FEEDING INJECTORS

AMERICAN Injector Co., 173 14th Ave., Detroit, Mich.

PENBERTHY Injector Co., Detroit, Mich. (See page 137.)

GREASE INJECTORS

(See Guns, Grease)

INTENSIFIERS

SPARK INTENSIFIERS

(See Gaps, Spark)

INSURANCE

EMPLOYERS Indemnity Exchange, Kansas City, Mo. (See page 179.)

IRONS

BODY OR TOP IRONS

ASHTABULA Bow Socket Co., Ashtabula, O

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

CORTLAND Carriage Goods Co., 115 Pt. Watson St., Cortland, N. Y.

CORTLAND Forging Co., Cleveland St., Cortland, N. Y.

COWLES & Co., C., New Haven, Conn. (See page 257.)

DESOCO—See Detroit Socket Co.

DETROIT Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

GENERAL Drop Forge Co., Buffalo, N. Y. (See page 827.)

MICHIGAN Bolt & Nut Works, ft. Meldrum Ave., Detroit, Mich.

RANDS Mfg. Co., Detroit, Mich. (See page 637.)

SCHERER & Co., H., Detroit, Mich.

SLAT IRONS

(For Bow Sockets—See Sockets, Bow)

AMESBURY Brass & Foundry Co., Amesbury, Mass.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

TIRE IRONS

(See Tools, Tire)

JACKS

LIFTING JACKS

ADELL Mfg. Co., Orange, Mass.

AJAX—See Lennox Jack Works.

ALRITE—See National Jack & Mfg. Co.

AMERICAN Chain Co., Bridgeport, Conn. "Weed." (See page 157.)

ASHLAND Mfg. Co., Ashland, O. "Eureka," "Atlas," "Speeder."

ATLAS—See Ashland Mfg. Co.

BADGER—See Walker Mfg. Co.

BARRETT—See Duff Mfg. Co.

BARTH Mfg. Co., 348 Milwaukee Ave., Milwaukee, Wis.

BATAVIA Clamp Co., 37 Center St., Batavia, N. Y. "Colts."

BOOTH—See Halladay Co.

BRISK Blast Mfg. Co., 1515-27 N. 25th St., St. Louis, Mo.

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1500 Pounds Capacity

¶ The 1916 Commerce Truck is the result of six years' successful effort expended in producing a delivery truck perfected by the lessons taught through experience.

$1075 F.O.B. DETROIT
WITH
CHOICE OF 3 BODIES

DEALERS: write for our Attractive Agency Proposition.

Commerce Motor Car Co.
DETROIT, MICH.

Move Quick

Write at once and if your territory is open secure the agency for the Acme Auto Truck.

The line is one of infinite possibilities for live dealers—every item of the specifications is a universally advertised standard article.

No missionary work required but you'll have to write at once.

Back of the truck is a strong financial organization.

Cadillac Auto Truck Company
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Cadillac, Mich.

HALL TRUCKS

"Hauls Everywhere"

The complete line of "Hall Trucks" will meet every requirement and satisfy every preference. From motor to wheels every part is made by a manufacturer of national reputation.

2-ton Worm Drive Chassis
3½-ton Double Side Chain Chassis
3½-tone Worm Drive Chassis
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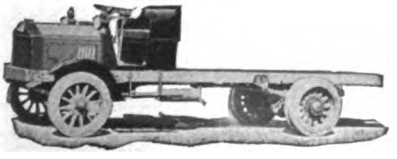
Bodies of all kinds for all purposes. Send for catalog of complete line of trucks.

Lewis-Hall Iron Works
—Established in 1873—
Detroit Michigan



BUILT LIKE A WATCH
ELGIN

Nine out of Nine Said

Elgin Six

Sprinkel Brothers, Aurora, Illinois, had nine customers for medium priced cars. As all nine were going to the Chicago Auto Show, J. M. Sprinkel asked each to name his choice. After seeing the latest models of all cars made in America, every one of the nine chose the Elgin Six.

How'd you like to sell a car like this?

$1485

f. o. b. Factory

Some Territories Open. Write

Elgin Motor Car Corporation
Chicago

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JACKS (Continued)

LIFTING JACKS (Continued)

BUCKEYE Jack Mfg. Co., Alliance, O.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CLEVELAND Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

COLTS—See Batavia Clamp Co.

CROSBY Co., 2120 Vodell St., Pittsburg, Pa.

DUFF Mfg. Co., Preble Ave., Pittsburg, (N. S.), Pa. "Barrett."

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

ELITE Mfg. Co., Ashland, O. "Reliable."

EUREKA—See Ashland Mfg. Co.

HALLIDAY Co., L. P., Streator, Ill. "Booth."

HANSON, Henry L., 26 Union St., Worcester, Mass.

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J. "Red Rack." (See page 457.)

HERCULES—See Western Brass Mfg. Works.

HI-LO Jack Co., 140 Green St., Worcester, Mass.

HYDRO JAK—See Randall-Faichney Co.

JIFFY Jack Co., 1104 Prospect Ave., S. E., Cleveland, O.

JOYCE-CRIDLAND Co., 329 S. Linden Ave., Dayton, O. "XX Century."

KAZOO—See National-Standard Co.

KIMBALL—See Mann Co.

LANE Bros. Co., 48 Prospect St., Poughkeepsie, N. Y.

LEADER—See National-Standard Co.

LITTLE GIANT—See Pratt Mfg. Co.

MANCO—See Mann Corp.

MANN Co., F. W., Milford, Mass. "Kimball."

MANN Corp., Kankakee, Ill. "Manco."

MOREAU & Pratt, 1834 Broadway, New York, N. Y. "Peteler." (See page 285.)

NATIONAL Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill. "Alrite," "Sturdy."

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

NATIONAL-STANDARD Co., Niles, Mich. "Kazoo," "Standard," "Leader."

OLIVER Mfg. Co., 326 S. Desplaines St., Chicago, Ill. "Peerless."

PEERLESS—See Oliver Mfg. Co.

PERFECT—See Walker Mfg. Co.

PETELER—See Moreau & Pratt.

PRATT Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Little Giant," "Pup."

PUP—See Pratt Mfg. Co.

RAISWELL—See Sipp Machine Co.

RANDALL-FAICHNEY Co., 76 Atherton St., (Jamaica Plain), Boston, Mass. "Hydro Jak."

RED RACK—See Hartford, Edward V.

RELIABLE—See Elite Mfg. Co.

SHAWVER Co., rear 31 W. Pleasant St. Springfield, O. "Springfield."

SIMPLEX—See Templeton, Kenly & Co.

SIPP Machine Co., Keen & Warren Sts., Paterson, N. J. "Raiswell."

SPEEDER—See Ashland Mfg. Co.

SPRINGFIELD—See Shawver Co.

STANDARD—See National-Standard Co.

STURDY—See National Jack & Mfg. Co.

TEMPLETON, Kenly & Co., 1020 S. Central Ave., Chicago, Ill. "Simplex."

TOPPING Bros., 122 Chambers St., New York, N. Y.

TRIUMPH—See Walker Mfg. Co.

VICTOR—See Walker Mfg. Co.

WALKER Mfg. Co., 366 Wisconson St., Racine, Wis. "Badger," "Triumph," "Perfect," "Victor."

WEED—See American Chain Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St., & C. B. & Q. R. R., Chicago, Ill. "Hercules." (See page 817.)

XX Century—See Joyce-Cridland Co.

SPECIAL JACKS

(Wheeled, Two and Four Wheel Lifting, Etc.)

ADAMS Jack Co. of America, Citizens National Bank Bldg., Los Angeles, Cal.

AMES Mfg. Co., Franklin, Pa. (See page 285.)

AUTOMOBILE Accessories Co., 816 W. North Ave., Baltimore, Md. "Norwood." (See page 681.)

BONE & Tucker Co., Chicago, Ill. "Tucker."

BRUNK Mfg. Co., St. Louis, Mo.

BURROUGHS Lift & Truck Co., Racine, Wis.

CADY Patent Appliance Co., 755 Central Ave., Cleveland, O.

EXCEL—See Randall-Faichney Co.

HOVEY—See Whetstone & Co.

NORWOOD—See Automobile Accessories Co.

ODELL Automatic Jack Co., Odell, Ill.

RANDALL-FAICHNEY Co., 76 Atherton St., (Jamaica Plain), Boston, Mass. "Excel."

READING Automobile Co., 126-28 N. Fifth St., Reading, Pa.

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y. (See page 285.)

STUCKER, J. M., Ottawa, Kans.

TUCKER—See Bone & Tucker Co.

WEAVER Mfg. Co., Springfield, Ill.

WHETSTONE & Co., John H., Armstrong Bldg., Lapeer, Mich. "Hovey."

TIRE SAVING JACKS

(For holding car off the floor when not in use)

AMERICAN Automatic Automobile Jack Co., American Bldg., Hicksville, O.

ASHLAND Mfg. Co., Ashland, O. "Eureka."

AUTO Jack Works, 300-08 Michigan St., La Grange, Ind. "Detroit."

BEARD Auto Lift Co., Pleasant Lake, Ind.

Complete Index to Classification appears on Pages 8 to 27.

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A jack—a truck and a turntable combined. For use in garages—repairshops and for sale to private owners.

AMES' AUTOMOBILE JACK TRUCKS earn their price in the saving on tires and the saving in time they effect.

Ames Manufacturing Co., Franklin, Pa.

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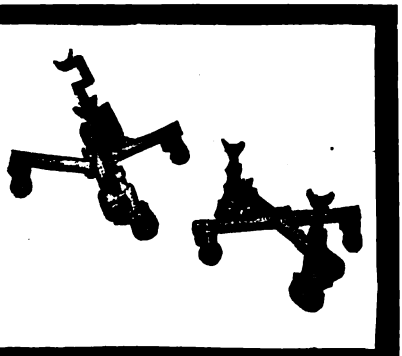

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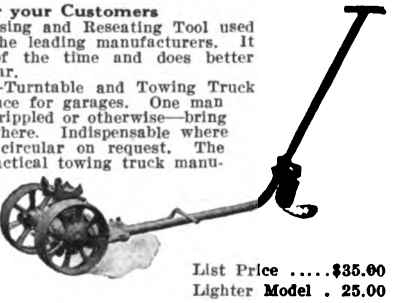
The Crone Valve Dressing and Reseating Tool used by practically all of the leading manufacturers. It saves three-quarters of the time and does better work. Send for circular.

Our Combination Jack-Turntable and Towing Truck is the handiest appliance for garages. One man can handle any car—crippled or otherwise—bring it in and put it anywhere. Indispensable where space is limited. A circular on request. The strongest and most practical towing truck manufactured.



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Any part can be bought separately.

Rub-On Manufacturing Co.

89 Brayton St.

BUFFALO, N. Y.

List Price $35.00

Lighter Model . 25.00

Liberal Discounts to Dealers.

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Write at once for detailed information and the name of your nearest distributor.

Peteler

AUTO JACK

The Peteler Jack gives you all of those things that you found lacking in other jacks. Some of the other high-class jacks have some of our good features—but nowhere else can you find in one jack all the advantages and constructional advances that make the Peteler Auto Jack the quickest seller you ever put on your counter.

Low step head for cars with low axles.

List Price { With regular head $3.50
With special low step head 4.00

MOREAU & PRATT, Inc.

Sole Licensees

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JACKS (Continued)

TIRE SAVING JACKS (Continued)

BRISK Blast Mfg. Co., 1515-27 N. 25th St., St. Louis, Mo.

BUFFINGTON & Co., C. A., Berkshire, N. Y.

CANNON, W. B., Park St. & Kalamazoo Ave., Vicksburg, Mich.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

DETROIT—See Auto Jack Works.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O. "Emco."

EKERN Bros., Flandreau, S. Dak. (See page 783.)

ELITE Mfg. Co., Ashland, O. "Reliable."

EMCO—See Eberhard Mfg. Co.

EUREKA—See Ashland Mfg. Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GLOBE Accessories Co., 1104 Prospect Ave., Cleveland, O.

GRAVES Mfg. Co., A. E., Builders Exchange, Worcester, Mass. "Pyramid."

HART Mfg. Co., 520 N. Main St., Findlay, O.

HOCO—See Hoeft & Co.

HOEFT & Co., Ashland Ave. & Kinzie St., Chicago, Ill. "Hoco."

JIFFY Jack Co., 1104 Prospect Ave., S. E., Cleveland, O.

McKINNON Dash Co., 252 Amherst St., Buffalo, N. Y.

MOORE—See Walker Mfg. Co.

MORGAN Mfg. Co., John St., Newport, R. I.

NATIONAL Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

NATIONAL-STANDARD Co., Niles, Mich. "Standard."

OLIVER Mfg. Co., 326 S. Desplaines St., Chicago, Ill. "Samson."

PERFECT—See Pratt Mfg. Co.

PRATT Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Perfect."

PYRAMID—See Graves Mfg. Co.

RACINE—See Walker Mfg. Co.

RELIABLE—See Elite Mfg. Co.

S. & S. Automatic Tireaze Co., Marysville, Kans.

ST. Louis Malleable Casting Co., 7800 N. Broadway, St. Louis, Mo.

SAMSON—See Oliver Mfg. Co.

SEDGWICK Mfg. Co., Third & Chestnut Sts., Richmond, Ind.

STANDARD—See National-Standard Co.

UNIQUE—See United States Mfg. Co.

UNITED States Mfg. Co., Mansfield, O. "Unique."

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis. "Moore," "Racine."

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WILBUR Lumber Co., Honey Creek, Wis.

JARS

RUBBER BATTERY JARS

AMERICAN Hard Rubber Co., 9 Mercer St., New York, N. Y. "Volcan." "Mercury."

BRUNSWICK-BALKE-COLLENDER Co., 623 S. Wabash Ave., Chicago, Ill.

LUZERNE Rubber Co., Trenton, N. J.

MERCURY—See American Hard Rubber Co.

STOKES Rubber Co., Jos., Trenton, N. J.

VOLCAN—See American Hard Rubber Co.

JIGS

SPEEDOMETER GEAR CENTERING JIGS

WEBER Automobile Supply Co., 6 E. Kiowa St., Colorado Springs, Colo.

JOBBERS

SUPPLY JOBBERS

(This is a list of Jobbers and Dealers in Automobile Supplies who advertise in this publication)

M. & M. Co., 480-500 Prospect Ave., Cleveland, O. (See page 843.)

MAJESTIC Mfg. & Specialty Co., 1355 Michigan Ave., Chicago, Ill. (See page 819.)

MOTOR Car Equipment Co., 21 W. 62d St., New York, N. Y. (See page 809.)

POST & Lester Co., 112 Allyn St., Hartford, Conn. (See page 781.)

PRUDEN Hardware Co., W. E., 864-66 Eighth Ave., New York, N. Y. (See page 735.)

REINHARD Bros. Co., Minneapolis, Minn. (See page 817.)

ZINKE Co., Chicago, Ill. (See pages 445 to 452.)

JOINTS

BALL JOINTS

(For spark and throttle connections)

BILLINGS & Spencer Co., Hartford, Conn.

BIRCHWOOD, C. W., 718 Dellwood Ave., Jacksonville, Fla.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. "Security." (See pages 287 and 443.)

CINCINNATI Ball Crank Co., Cincinnati, O. (See page 183.)

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

GREER, Frederic, 525 W. Van Buren St., Chicago, Ill.

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ACME
Universal Joints

These are the best universal joints that a motor car manufacturer could put in his product. They embody every essential feature necessary to make it the nearest perfect Universal Joint for use in motor cars and trucks.

ACME JOINTS are remarkable for their simplicity and durability and are best adapted to withstand the severe wear and strain to which they are subjected in motor car usage.

The ACME can be removed from a car without moving a unit of the power transmission. This feature alone gives it a great advantage over any other joint in the market.

They are so accurately made that they are interchangeable and necessary repairs can be made without difficulty.

Ask us to prove that Acme Joints are better than those you are now using—we'll do it.

The Acme Universal Joint Mfg. Company

1425 Fulford St., Kalamazoo, Mich.

UNIVERSAL JOINTS

K.B. CO. — KANT BUST

BEST FOR

Commercial Cars

AND

Pleasure Vehicles

Made from the finest Drop Forgings, especially case-hardened throughout. Our Universal Joints have no equal for Quality, Design, High Finish, and Skilled Workmanship.

We guarantee deliveries to commence within two or three weeks from receipt of specifications.

Write us for our catalog and get our prices

KANT BUST — K.B. CO.

MADE IN — HARTFORD, CONN. —

BY

THE KINSLER-BENNETT CO.

69 Vernon Street

WESTERN SALES AGENTS

AMERICAN DISTRIBUTING CO., Jackson, Mich.

"SECURITY" BALL JOINTS

Not too tight nor too loose—Always in proper adjustment—No Cotter Pins to lose—No Screws to come out—Easily put in place—Impossible to come apart—Ball Head in line with rod—Firm Joint—No Rattle—

THE CHICAGO SCREW CO.

Homan Ave. & Fillmore St., Chicago

ALL MAKES
ALL SIZES

BALL BEARINGS REPAIRED

We have efficient and experienced workmen. We give prompt attention. We guarantee our work. We are the Ball Bearing Service Station of the country.

"Service That Is Service"

Write for prices

The Bearings Company of Pennsylvania, 684 North Broad Street Philadelphia, Pa.

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JOINTS (Continued)

BALL JOINTS (Continued)

MECHANICAL & Electrical Mfg. Co., 2225 Prairie Ave., Chicago, Ill. "Memco."

MEMCO—See Mechanical & Electrical Mfg. Co.

PENINSULAR Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

~~PERFECTION—See Porter & Co.~~

PORTER & Co., W. S., 608 S. Dearborn St., Chicago, Ill. "Perfection."

SECURITY—See Chicago Screw Co.

SMITH Mfg. Co., F. H., 3037 Carroll Ave., Chicago, Ill.

SPEEDOMETER SWIVEL JOINTS

OGDEN Fibre Gear & Tire Co., Columbus, Ind.

UNIVERSAL JOINTS

ACME Universal Joint Mfg. Co., 1425 Fulford St., Kalamazoo, Mich. (See page 287.)

ARVAC Mfg. Co., Anderson, Ind.

BLOOD Bros. Machine Co., Allegan, Mich.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

COOPER Flexible Transmission Co., Eighth Ave. & 18th St., Brooklyn, N. Y.

DETROIT—See Universal Products Co.

EVANS—See Merchant & Evans Co.

GRAY & Prior Machine Co., 32 Suffield St., Hartford, Conn.

HARDY—See Thermoid Rubber Co.

HARTFORD Auto Parts Co., Hartford, Conn. (See page 863.)

K-B—See Kinsler-Bennett Co.

KINSLER-BENNETT Co., 69 Vernon St., Hartford, Conn. "K-B." (See page 287.)

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

LEHMAN, I., 2187 E. Second St., Cleveland, O.

MECHANICS Machine Co., Ninth St. & 19th Ave., Rockford, Ill. "Swenson." (See pages 300 and 301.)

MERCHANT & Evans Co., Philadelphia, Pa. "Evans." (See page 405.)

MICHIGAN Auto-Joint Co., 314 Bowery St., Grand Rapids, Mich.

MUTUAL Machine Co., 25 Wells St., Hartford, Conn. "Warrens."

SPICER Mfg. Co., South Plainfield, N. J. (See page 747.)

SWENSON—See Mechanics Machine Co.

THERMOID Rubber Co., Trenton, N. J. "Hardy." (See pages 81 and 289.)

TRIO Mfg. Co., 1192-1206 Bellevue Ave., Detroit, Mich.

UNIVERSAL Machine Co., Adams St., Bowling Green, O.

UNIVERSAL Products Co., 114-18 Woodbridge St., E., Detroit, Mich. "Detroit."

WALKER Joint Co., 1613 Dime Bank Bldg., Detroit, Mich. (See page 306.)

WARRENS—See Mutual Machine Co.

KEYS

ACETYLENE GAS TANK KEYS

BUFFUM Tool Co., Louisiana, Mo.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

HARRIS & Reed Mfg. Co., 1500-22 W. 15th St., Chicago, Ill.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco." (See page 613.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

KITS

TIRE REPAIR KITS

(See also Cement, Tire; also Patches, Tire; also Plugs, Tire; also Sleeves, Tire)

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

H. J. K. Co., 26½ Canal St., Dayton, O. "Lightning."

HAZEN-BROWN Co., 430 Court St., Brockton, Mass.

LIGHTNING—See H. J. K. Co.

M. & M. Mfg. Co., Miami St., Akron, O.

MICHELIN Tire Co., Milltown, N. J. (See Inside Back Cover.)

PEERLESS Cement Co., 39 Viaduct, Akron, O.

SAMPSON—See Stevens & Co.

STEVENS & Co., 375 Broadway, New York, N. Y. "Sampson." (See page 813.)

TINGLEY & Co., Chas. O., Rahway, N. J.

VULTITE Rubber Co., Bridgeport, Conn. (See page 797.)

YATMAN Rubber Co., 257-69 Mt. Pleasant Ave., Newark, N. J.

KNUCKLES

STEERING KNUCKLES

(See Axles; also Forgings)

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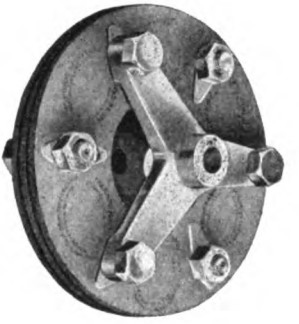
THERMOID-HARDY FABRIC FLEXIBLE COUPLING

PATENTED FEB. 22, 1916



Frictionless Universal Joints constructed with Thermoid-Hardy Fabric Laminated Discs are flexible and possess many advantages over all other universal joints.

Require no lubrication, as there are no metal to metal wearing surfaces, and are noiseless and frictionless for the same reason.

The cushioning effect of the fabric discs prevents the transmission of shocks and sounds and minimizes the wear on all adjacent bearings.

Our patented construction produces a disc with a uniform strength in every direction and between all points.

Practically indestructible, will not stretch or shrink and not affected by water or oil or any heat to which it may be subjected in service.

Economical to assemble and install because of almost entire absence of machined parts. Eliminates back-lash.

Has been adopted or is being tested by a large percentage of the most prominent engineers and factories in this and foreign countries. Not an untried experiment.

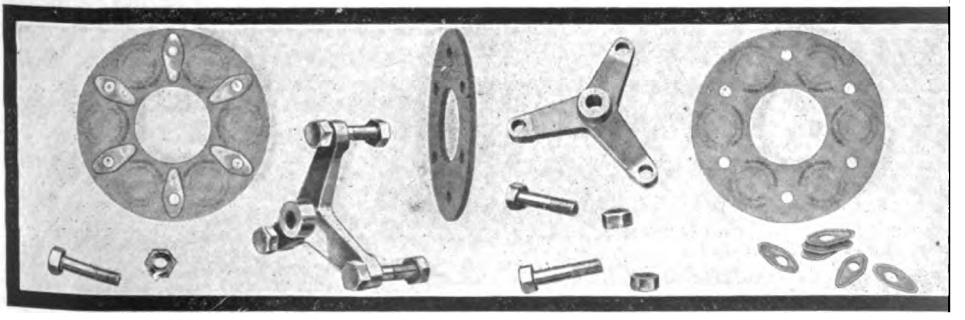
Guarantee:—Thermoid-Hardy Flexible Joint Discs will make good or we will!

Full information furnished by the sole American manufacturers.

Thermoid Rubber Company

TRENTON, N. J.

Ed. J. Hardy & Co. Ltd., Coventry, England. Sole European Manufacturers



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LACE

COACH LACE, WEBBING AND CORD

BRIDGEPORT Coach Lace Co., 1731-37 Broadway, New York, N. Y.

COLUMBIA—See Horstmann Co.

HORSTMANN Co., Wm. H., Fifth & Cherry Sts., Philadelphia, Pa. "Columbia."

SCHLEGEL Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.

VOGT Mfg. & Coach Lace Co., 403-10 St. Paul St., Rochester, N. Y.

LACING

FABRIC RADIATOR LACING

(See also Leather, Rawhide Lace)

GILMER Co., L. H. (Tacony), Philadelphia, Pa.
(See page 105.)

STANDARD Woven Fabric Co., Walpole, Mass.
(See pages 75 to 78.)

LAMPS

ACETYLENE LAMPS OR HEADLIGHTS

B & L Auto Lamp Co., 534-50 W. 58th St., New York, N. C.
(See page 293.)

BADGER Brass Mfg. Co., Lyman Ave., Kenosha, Wis. "Solar."

BROWN Mfg. Co., John W., Columbus, O.
(See page 307.)

CHICAGO Auto Lamp Works, 900-04 W. Lake St., Chicago, Ill. "Diamond."

COLUMBIA—See Hine-Watt Mfg. Co.

CORCORAN-VICTOR Co., Cincinnati, O.
(See page 507.)

DIAMOND—See Chicago Auto Lamp Works.

DRESSEL Railway Lamp Works, 3860-80 Park Ave., New York, N. Y.

E & J—See Edmunds & Jones Corp.

EDMUNDS & Jones Corp., Detroit, Mich. "E & J."
(See page 321.)

GRAY & Davis, Boston, Mass.
(See pages 483 to 486.)

HALL Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich.

HAWTHORNE Mfg. Co., 38 Spruce St., Bridgeport, Conn. "Old Sol."
(See page 307.)

HINE-WATT Mfg. Co., 130 N. Market St., Chicago, Ill. "Columbia."

HOFACKER Mfg. Co., 555 W. 42d St., New York, N. Y.
(See page 293.)

INDIANA Lamp Co., Connersville, Ind.
(See pages 446 and 447.)

NEVEROUT—See Rose Mfg. Co.

OLD SOL—See Hawthorne Mfg. Co.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

SOLAR—See Badger Brass Mfg. Co.

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

WIDMAN & Co., J. C., 14th & 15th Sts. & G. T. Ry., Detroit, Mich.

DASH LAMPS

(See Lamps, Electric Dash)

ELECTRIC LAMPS OR HEADLIGHTS

(See Headlights, Electric)

ELECTRIC DASH OR GAGE LAMPS

AID Mfg. Co., 2625 Stewart Ave., Chicago, Ill.

CAMPBELL Co., A. S., 234 Commercial St., Boston, Mass. "Cello."

CELLO—See Campbell Co.

CHICAGO Electric Mfg. Co., 2317 S. Halsted St., Chicago, Ill. "Handy."

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

COMET—See Crane Mfg. Co.

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

CRANE Mfg. Co., Galesburg, Ill. "Comet."

CULVER-STEARNS Mfg. Co., Detroit, Mich.
(See page 699.)

EDMUNDS & Jones Corp., Detroit, Mich.
(See page 321.)

FAW, J. H., 41 Warren St., New York, N. Y.
(See page 845.)

GUIDE Motor Lamp Mfg. Co., Cleveland, O.
(See page 291.)

HANDY—See Chicago Electric Mfg. Co.

HOLT & Beebee Co., 51 Chardon St., Boston, Mass.

LIBERTY Cut Glass Works, Egg Harbor City, N. J.
(See page 269.)

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto."
(See page 257.)

MORSE, Frank W., 293 Congress St., Boston, Mass.
(See page 517.)

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

PRESTO—See Metal Specialties Mfg. Co.

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

S-H—See Stuart-Howland Co.

STUART-HOWLAND Co., 131-41 Federal St. Boston, Mass. "S-H."

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Complete Index to Classification appears on Pages 8 to 27.

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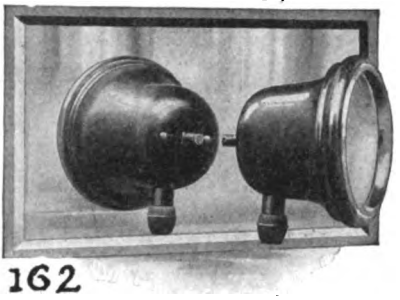
Guide

MOTOR LAMPS

(Electric)



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Prices are very attractive and we take good care of our customers.

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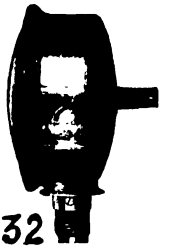
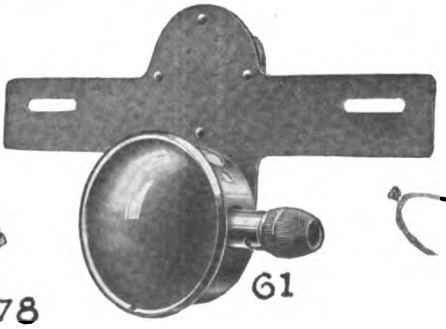
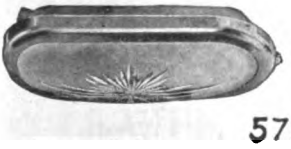
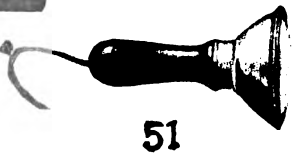
Guide Motor Lamp Mfg. Company

CLEVELAND, O.









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LAMPS (Continued)

ELECTRIC GAGE LAMPS

(See Lamps, Electric Dash)

ELECTRIC HAND OR INSPECTION LAMPS

(Lamp and flexible cord for attachment to ignition battery)

ADAMS-BAGNALL Electric Co., Cleveland, O.

AMERICAN Enamel Co., Neville St., Providence, R. I. "Britelite."

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

BRITELITE—See American Enamel Co.

CAMPBELL Co., A. S., 284 Commercial St., Boston, Mass. "Cello."

CELLO—See Campbell Co.

CHICAGO Electric Mfg. Co., 2317 S. Halsted St., Chicago, Ill. "Handy."

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

CRESCENT—See McGill Mfg. Co.

CULVER-STEARNS Mfg. Co., Detroit, Mich.
(See page 699.)

CUNO Engineering Corp., 80 S. Vine St., Meriden, Conn.

EVEREADY—See American Ever Ready Works.

GENERAL Electric Co., Schenectady, N. Y.

GIBSON-HOLLISTER Mfg. Co., 3380 Washington St., Boston, Mass. "Wylite."
(See page 391 and 392.)

GUIDE Motor Lamp Mfg. Co., Cleveland, O.
(See page 291.)

HALLADAY Co., L. P., Streator, Ill.

HANDY—See Chicago Electric Mfg. Co.

HANDY-ANDY Electric Co., 9 S. Clinton St., Chicago, Ill.

HARVARD Electric Co., 525 W. Van Buren St., Chicago, Ill.

McGILL Mfg. Co., 34 Oak St., Valparaiso, Ind. "Thumbswitch," "Crescent."

MABEYS Electric & Mfg. Co., 940 N. Pennsylvania St., Indianapolis, Ind.

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto."
(See page 257.)

MORSE, Frank W., 293 Congress St., Boston, Mass.
(See page 517.)

NIAGARA Searchlight Co., Eighth St. & Ferry Ave., Niagara Falls, N. Y.

NITELITE—See Providence Electric Mfg. Co.

PARKER-HAMMERTON Mfg. Co., 122 Milk St., Boston, Mass.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

PREMIER Electric Co., 4053 Ravenswood Ave., Chicago, Ill. "Stickalite."
(See page 559.)

PRESTO—See Metal Specialties Mfg. Co.

PROVIDENCE Electric Mfg. Co., 28 Broad St., Providence, R. I. "Nitelite."

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

RUSSELL & Co., T. F., 170 Summer St., Boston, Mass.

S.-H.—See Stuart-Howland Co.

STICKALITE—See Premier Electric Co.

STUART-HOWLAND Co., 131-41 Federal St. Boston, Mass. "S-H."

THUMBSWITCH—See McGill Mfg. Co.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

WYLITE—See Gilson-Hollister Mfg. Co.

ELECTRIC INSPECTION LAMPS

(See Lamps, Electric H and)

ELECTRIC SIDE AND TAIL LAMPS

ADAMS-BAGNALL Electric Co., Cleveland, O.

AUTO Fender Safety Lamp Co., Corinth, N. Y.

B & L Auto Lamp Co., 534-50 W. 58th St., New York, N. Y.
(See page 293.)

BADGER Brass Mfg. Co., Lyman Ave., Kenosha, Wis. "Solar."

BOESCH Lamp Co., 1135 Mission St., San Francisco, Cal.

BROWN Mfg. Co., John W., Columbus, O.
(See page 307.)

CAMPBELL Co., A. S., 284 Commercial St., Boston, Mass. "Cello."

CELLO—See Campbell Co.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O. "Pathfinder."

CORCORAN-VICTOR Co., Cincinnati, O.
(See page 507.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

DRESSEL Railway Lamp Works, 3360-80 Park Ave., New York, N. Y.

EDMUNDS & Jones Corp., Detroit, Mich.
(See page 321.)

ELECTRIC Auto-Lite Co., Toledo, O.
(See pages 215 to 218.)

ELECTROBOLA—See Gemco Mfg. Co.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

EXCELITE—See Newfield Silver Mfg. Co.

GEM Stamped Steel Co., Chelsea, Mass., (Tail lamps only.)
(See page 479.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Electrobola."
(See page 127.)

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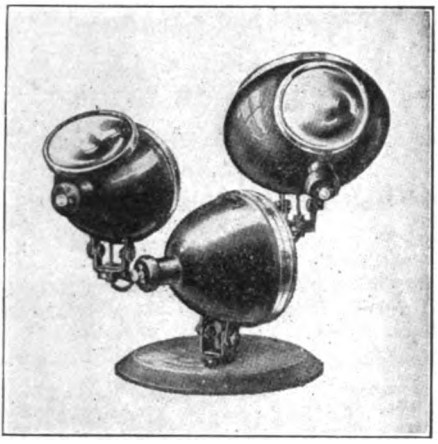
Kilborn-Sauer Searchlights



Body and handle one piece heavy metal. Most rigid lamp on the market. Push and Pull switch in handle. Universal Bracket.

Six and eight inch diameter with or without 4" diminishing mirrors.

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Fairfield, Conn.

Write for Prices, etc.

No-Lining Dash and Tail Lamp

The No-Lining lamp is made for either the dash or rear light. It is an extremely compact lamp, having no lining and equipped with oil fount which cannot rattle or drop out. Manufactured of heavy gauge brass and fur-

No-lining dash and tail lamp.

nished with flat or round brackets as desired. Finished in either black and brass, black and nickel and all black. The same lamp is furnished with two white lenses for the dash. Also manufactured in combination oil and electric.

We are also manufacturers of all kinds of gas and electric automobile lamps together with oil lamps.

Manufactured by

THE HOFACKER MFG. COMPANY

555 West 42nd Street, New York City

Latest Designs of Lamps for 1916 Cars

SPOT LIGHT

for models 83-84-86-75 Overland Cars

Same lamp can be had with or without mirror.

Models 63 & 63A

63—6 in. diam. Price each $6.50

63A—7 in. diam. Price each $7.00

ELECTRIC DOUBLE HEADLIGHT

100-A—Bottom Lamp 9¼ inch diameter, Top lamp 3¼ inch diameter.
Price, each $8.00

101 A—Bottom lamp 10¼ inch diameter, Top lamp 3¼ inch diameter.
Price, each $8.50

102 A—Bottom lamp 11¼ inch diameter, Top lamp 3¼ inch diameter.
Price, each $9.50

This is our very latest model. It can be used on any car. The top lamp is used instead of a side lamp. It is the most attractive lamp on the market. The focusing device is in the back of the body.

MODELS 61 AND 62

61—6 in. diam. Price each $5.50

62—7 in. diam. Price each $6.00

Same can be had with or without mirror.

B & L AUTO LAMP CO., 534-550 W. 58th St., New York City

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LAMPS (Continued)

ELECTRIC SIDE AND TAIL LAMPS (Continued)

GRAY & Davis, Boston, Mass. (See pages 483 to 486.)

GUIDE Motor Lamp Mfg. Co., Cleveland, O. (See page 291.)

HALL Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich.

HAMMER Co., E. A., 1839 Euclid Ave., Cleveland, O.

HAWTHORNE Mfg. Co., 38 Spruce St., Bridgeport, Conn. "Old Sol." (See page 307.)

HOFACKER Mfg. Co., 555 W. 42d St., New York, N. Y. (See page 293.)

HOLT & Beebee Co., 51 Chardon St., Boston, Mass.

INDIANA Lamp Co., Connersville, Ind. (See pages 446 and 447.)

KILBORN-SAUER Co., Fairfield, Conn. (See page 293.)

MALCO—See Malton Specialty Co.

MALTON Specialty Co., 755 Boylston St., Boston, Mass. (Tail lamps only). "Malco." (See page 607.)

NEVEROUT—See Rose Mfg. Co.

NEWFIELD Silver Mfg. Co., State & Ash Sts., Bridgeport, Conn. "Excelite."

OLD SOL—See Hawthorne Mfg. Co.

PATHFINDER—See Columbus Auto Brass Co

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

ROSCO—See Rosen & Co.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco." (See page 183.)

S & M Lamp Co., 117 W. 36th Pl., Los Angeles, Cal.

SILVEY Electric Co., 10-16 S. Canal St., Dayton, O.

SOLAR—See Badger Brass Mfg. Co.

STAFFORD Auto Lamp & Number Co., 1475 Michigan Ave., Chicago, Ill. (Tail lamps only.)

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

VICTOR Auto Parts Co., Second & Elm Sts., Cincinnati, O.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WIDMAN & Co., J. C., 14th & 15th Sts., & G. T. Ry., Detroit, Mich.

ELECTRIC TAIL LAMPS

(See Lamps, Electric Side and Tail)

GAGE LAMPS

(See Lamps, Electric Dash or Gage)

HAND LAMPS

(See Lamps, Electric Hand)

INSPECTION LAMPS

(See Lamps, Electric, Hand or Inspection)

MINIATURE INCANDESCENT LAMPS

ARGON—See Wood Mfg. Co.

BRYAN-MARSH Division of National Lamp Works, 431 S. Dearborn St., Chicago, Ill.

C. A. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

COLUMBIA Lamp Division of National Lamp Works, 706 Chestnut St., St. Louis, Mo.

DAVIS Tungsten Lamp Works, Union Hill, N. J. (See page 309.)

DOMESTIC Tungsten Lamp Co., 575 Bergenline Ave., West New York, N. J. (See page 309.)

EDISON Lamp Works of General Electric Co., Harrison, N. J.

FEDERAL Miniature Lamp Division, National Lamp Works of General Electric Co., 501 S. Jefferson St., Chicago, Ill. (See page 307.)

FRANCO—See Interstate Electric Novelty Co.

GENERAL Electric Co., Schenectady, N. Y.

INDEPENDENT Lamp & Wire Co., 1733 Broadway, New York, N. Y.

INTERSTATE Electric Novelty Co., 104 S. Fourth St., Brooklyn, N. Y. "Franco."

JAEGER Co., H. J., Shippin St. & Park Ave., Weehawken, N. J.

McCANDLESS & Co., H. W., 406 W. 31st St., New York, N. Y. (See page 843.)

NITROS—See Jaeger Co.

NITROS—See Vosburgh Miniature Lamp Co.

U. S. Incandescent Lamp Co., Laclede Bldg., St. Louis, Mo.

VAC-U-RAY—See Vosburgh Miniature Lamp Co.

VACUU-RITE Lamp Co., 155-59 W. Division St., Chicago, Ill.

VOSBURGH Miniature Lamp Co., 289 Valley Rd., West Orange, N. J. "Nitros," "Vac-U-Ray."

WEEHAWKEN Tungsten Lamp Co., 552 Gregory Ave., Weehawken, N. J.

WOOD Mfg. Co., Dept. M., Fairfield, Conn. "Argon." (See pages 300, 301 and 857.)

OIL SIDE AND TAIL LAMPS

ADAMS & Westlake Co., Chicago, Ill. "Adlake." (See page 423.)

ADLAKE—See Adams & Westlake Co.

Complete Index to Classification appears on Pages 8 to 27.

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USL TRADE MARK STARTER BATTERIES

U S LIGHT & HEAT CORPORATION

FREEDOM
From BATTERY TROUBLES

If you would solve your troublesome battery problems, get a USL and "Be Battery Happy."

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From the best information we can get, based on estimated outputs of cars, USL batteries will be specified equipment on more motor cars for 1916-1917 than any other. This ought to mean something to you.

Sold under a 15 months' guaranteed adjustment plan. Built to fit all cars and all starting and lighting systems. Free inspection. Liberal "trade-in" arrangements. Service stations in all principal cities of United States.

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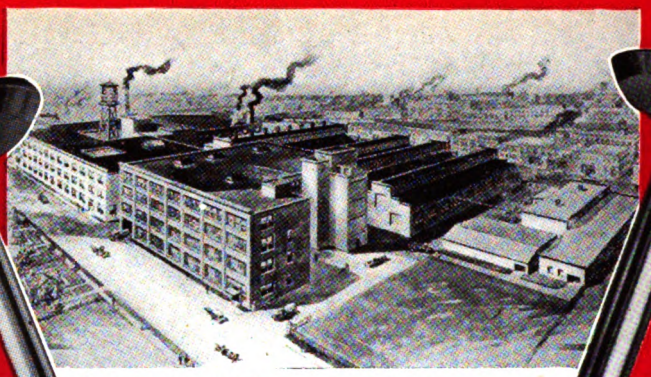

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Car manufacturers no longer look upon us as an ordinary parts factory where they can buy valves and spring bolts.

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E. W. P. Alloy
Nickel Steel
Cast Iron Head
Cast Iron Seat

Consider us—not as a separate organization but as—a valve or spring bolt department.

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Grease Bolts
Oil Bolts
Ground or Polished
Made to Specification

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CLEVELAND, O.

Detroit Office
FORD BLDG.

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Radius Rods
Round Stock Spring Clips

Detroit **Michigan**

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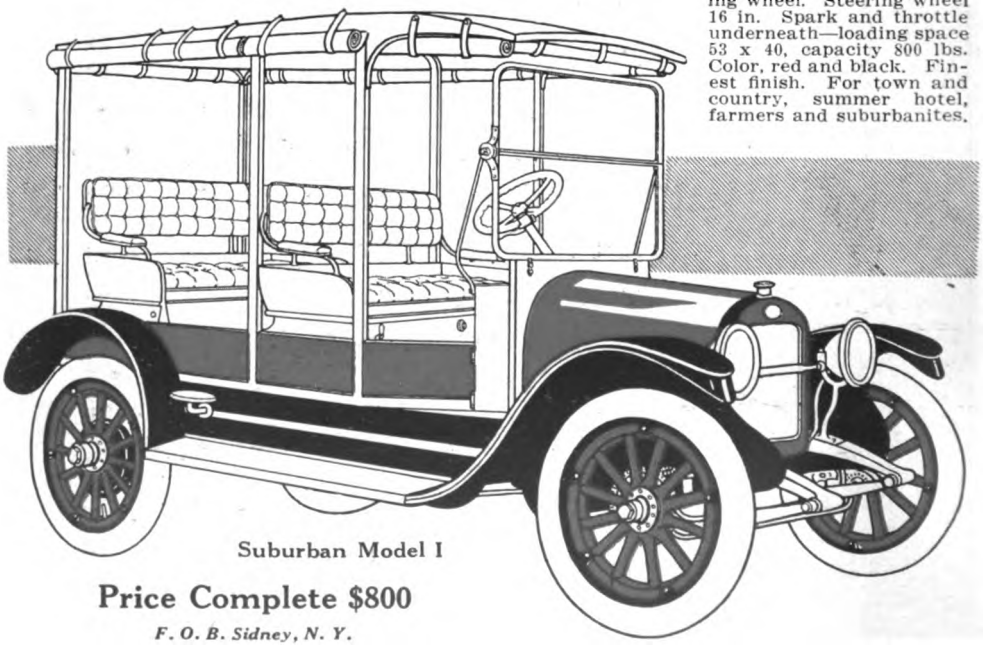
Hatfield SUBURBAN 1917

UNLESS you are looking for a car that is unusual, not alone in appearance and construction, but in the absolutely demonstrated fact of its living up to all and more than the requirements of an ordinary automobile, either for business or pleasure, you had best not waste your time reading this ad.

The Hatfield is built, after thirty years' experience in catering to the finest carriage trade in America, not only to meet the exacting requirements of the **Eye** buyer, but the more exacting requirements of those who buy an automobile "not when they see it" but when they "look into it." It's the car the salesman wants you to question, wants you to try, wants you to buy.

Read the specifications opposite—stack them up against any other car at anywhere near the price, and draw your own conclusion. Take hold of the car and try to pull off the fenders and note the construction—it's the same all through even to the paint—14 coats put on by hand. So many points like this we cannot mention them all. You will have to write for fuller information, either for a car or for territory. Immediate delivery if you write now.

Model I same as Model H except clock and steering wheel. Steering wheel 16 in. Spark and throttle underneath—loading space 53 x 40, capacity 800 lbs. Color, red and black. Finest finish. For town and country, summer hotel, farmers and suburbanites.



Suburban Model I

Price Complete $800

F. O. B. Sidney, N. Y.

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Hatfield ROADSTER 1917

Specifications: Model H.

Motor—Golden, Belknap & Schwartz; 4 cyl., en bloc, high speed, L-head, valves enclosed 3¾x4¼. Three point suspension, unit power plant. Fly wheel and all gears fully enclosed. Crank shaft, 3 bearings. Front 1½x3⅞, center 1⅝x2¼, rear 1⅝x4. Valve opening, 1⅝. Cylinder head removable. Develops on block 37 H.P. Silence, flexibility, power. 5 bearing cam shaft removable. 5 miles on high in traffic.

Cooling—Thermo-Syphon.
Transmission — Grant-Lees — Center control (ball type).
Clutch—Golden, Belknap & Schwartz—Disc—non-grabbing.
Lubrication — Constant level splash with pump—delivers oil at both ends of motor.
Ignition—Connecticut—Improved type.
Carburetor—Stromberg.
Front axle—One piece drop forged, annular ball bearings.
Rear axle—Full floating—hub drive. Bearings, roller and annular ball. Differential inspection plate easily removed.
Brakes—2 sets—external and internal.

Wheel Base 106 in. Tread 56 in.
Wheels — Wood, artillery type, 12 spokes.
Tires—Firestone 31 x 4. Non Skid in rear. Demountable rims.
Frame—Channel steel; five cross members.
Drive—Hotchkiss—2 universal joints—torque truss.
Springs—Front—semi-elliptic. Rear—Full cantilever floating.
Steering—Irreversible type—worm gear—18-in. walnut wheel, notched, Spider insert, control on top. Left Hand Drive.
Fenders—Extra strong. Apron on front.
Starter—Disco—Switch on toe board.

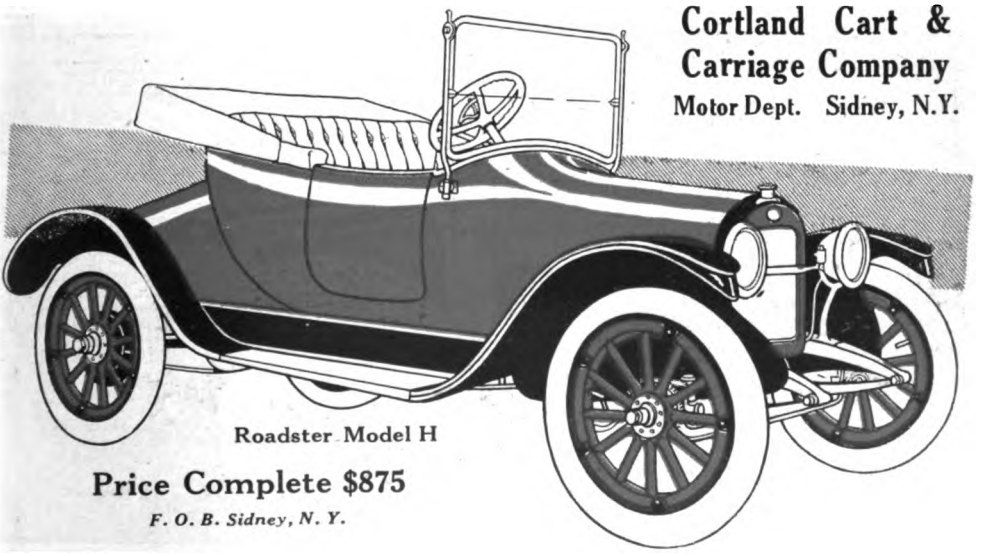
Lights—Electric head (Double bulb), tail, dash, trouble with cord.

Body—Vehicle Fibre—no noise—Extra wide deep seat—high back—wide doors with pockets. 15 gal. tank—Ample room for 2 suit cases.

Paint—14 coats—by hand. Standard color Regent Green body. Chassis Black. Additional colors arranged by correspondence.

Upholstery—Deep and luxurious cushions and back padded with curled hair. Top best silk mohair—with dust hood. Bair top holders.

Equipment—Stewart vacuum feed, Stewart speedometer, windshield, sight oil gauge, battery indicator. All fixtures flush type, nickel plated. Run and floor boards, linoleum covered, aluminum bound. Extra rim, tool kit, including jack and pump. Storage battery, extra size 12 volt.



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C. A. S.

799-801 Woodward

EXCLUSIVE

C. D. CUTTING

J. W. A

FALLS MACHINE COMPANY
Sheboygan Falls, Wis.

Manufacturers of pleasure and commercial automobile motors

C. A. S. PRODUCTS CO.
Successors to
THE FOSTER GEAR CO.
Columbus, Ohio

Manufacturers of steering gears for pleasure and commercial vehicles

THE H. & N. CARBURETOR CO., Inc.
New York City

Manufacturers of Gasolene and Kerosene Carburetors

FEDERAL ASBESTOS CO.
Paterson, N. J.

Manufacturers of Bestbestos brake lining

WOOD MANUFACTURING CO.
Fairfield, Conn.

Manufacturers of head lights, tail lights and spot lights

Address all inquiries to

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Sales Co.

Avenue, Detroit, Mich.
REPRESENTATIVES
MSTRONG
R. W. SMITH

MECHANICS MACHINE CO.
Rockford, Ill.
Manufacturers of Rockford transmissions and Swenson universal joints

SIMPLEX MAGNETO CO.
New York City
Manufacturers of Magnetos

ROCKFORD MACHINE CO.
Rockford, Ill.
Manufacturers of light and heavy front and rear axles for pleasure and commercial vehicles

THE E. R. WAGNER MFG. CO.
N. Milwaukee, Wis.
Manufacturers of automobile stampings

BOULEE-FRAZER LEATHER CO.
New York, N. Y.
Automobile Leather

C. A. S. Sales Company

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The New Price $15—

THE "OXYGENERATOR" CARBON KILLER

TRADE-MARK REG. U. S. PATENT OFFICE

We Have Raised the Price of

The OXY

There always has been good money for dealers handling THE OXYGENERATOR. Now there's more of it. We've raised the price from $10 to $15 because the demand for OXYGENERATORS makes it possible to declare a margin of profit worth every dealer's while—a discount on a going accessory that no dealer, big or small, can afford to overlook.

THE OXYGENERATOR is one of the best advertised accessories on the market. It is nationally known, nationally sold and nationally used. It fits every car that's on the road—and there are nearly 2,000,000 of them that are live prospects for dealers to close with liberal profits.

Burns carbon accumulations out of cylinders like paper in air, and prevents further formations. Operates on the accepted principle of introduction of super-heated steam into the cylinders. Endorsed by motor car experts and graduate engineers.

Cyrus B. Olson, Inventor and Perfector of the OXYGENERATOR

OXYGENERATOR sells easy on 30-day

THE OXYGENERAT

1922 S. Michigan Avenue

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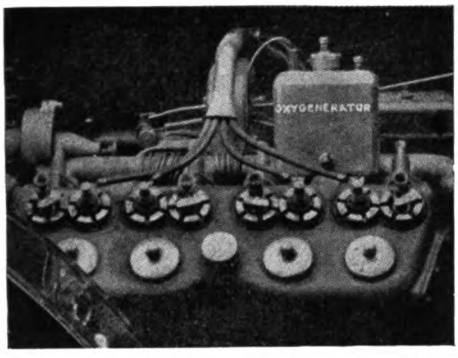
Insures Bigger Dealers' Discounts



Oxygenerator Installed on 8 Cylinder Cadillac

Formerly $10—Now $15

With Increased Dealers' Discounts]

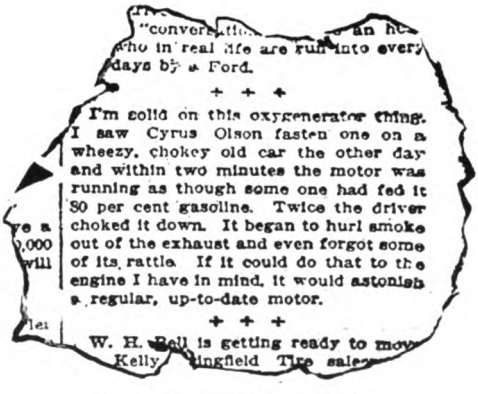
GENERATOR

We are now handling coupon inquiries from advertisements—*enclosing cash deposits*—from every part of the United States, through the Chicago office, when not represented in territory from which our orders come. We don't want to handle Maine and California business in Chicago. That's why we are now in a position to talk 25 and 30% discounts to dealers throughout the United States—where the business comes from.

There's a chance for every dealer to clean up good profits in every territory where there are automobiles. One OXYGENERATOR sold in your town—perhaps *on a live tip we can send you*—means *continued sales on the guarantee that can't be beat:*

15 *to* 25% *more power*
15 *to* 30% *fuel saving*
15 *to* 30% *more speed*
40% *acceleration increase*
50% *easier starting*
50 *to* 90% *less carbon*

trial. Not one has ever come back.



"conver... an h... who in real life are run into every days by a Ford.

+ + +

I'm solid on this oxygenerator thing. I saw Cyrus Olson fasten one on a wheezy, chokey old car the other day and within two minutes the motor was running as though some one had fed it 80 per cent gasoline. Twice the driver choked it down. It began to hurl smoke out of the exhaust and even forgot some of its rattle. If it could do that to the engine I have in mind, it would astonish a regular, up-to-date motor.

+ + +

W. H. Bell is getting ready to mov... Kelly ...ingfield Tire sales...

Sexton in the Chicago Herald
April 29, 1916

OR COMPANY

Chicago, Illinois

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THE WESTERN SPRING & AXLE COMPANY

CARTHAGE, CINCINNATI, OHIO

The strains and vibrations to which motor car springs and axles are constantly subjected can be provided for only by those who have absolute knowledge of the exact science of heat treatment of steel for this use.

In our laboratories trained metallurgists of many years' experience are given every modern facility for their work. In addition we have educated our workmen and the inevitable result is the production of a finished product, perfect in every detail which is supplied at a price that affects a saving to you in the manufacturing cost of your cars while adding to your reputation for conscientious construction.

CONSTITUENT PLANTS

Cleveland Axle Manufacturing Co., Canton, O.
Cleveland-Canton Spring Co., Canton, O.
Hess-Pontiac Spring & Axle Co., Pontiac, Mich.
Hess Spring & Axle Co., Cincinnati, O.
J. B. Armstrong Manufacturing Company, Flint, Mich.
Cincinnati & Hammond Spring Co., Cincinnati, O.
Ansted Spring & Axle Co., Connersville, Ind.
Spears Axle Company, Wheeling, W. Va.
Champ Spring Co., St. Louis, Mo.

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The Mark of Bearing Quality

Quality is superiority.

Quality in a bearing explains its dependable performance.

The work that Hyatt Roller Bearings do in millions of automobiles, in thousands of motor trucks, in farm tractors, in line shafting—wherever there is a wheel that turns—is the most practical demonstration of bearing dependability.

This mark, therefore—the mark of the Hyatt Roller Bearing—is the sign of bearing quality wherever it appears.

HYATT

Make sure that your new car has Hyatt Roller Bearings.

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WALKER UNIVERSAL JOINTS

"Service—Quality—Economy"

Mechanical engineers readily appreciate the outstanding features of these Joints. The large surfaces, the method of automatically distributing lubrication to working parts, and the means of taking up slack by a simple, positive locking device are exclusive to our product.

The Walker Universal Joint is accurately machined from carefully selected metals. Its bearing surface of cast iron works against steel. It holds the drive shaft absolutely central, retains its lubricant and is fitted with an effective dust guard.

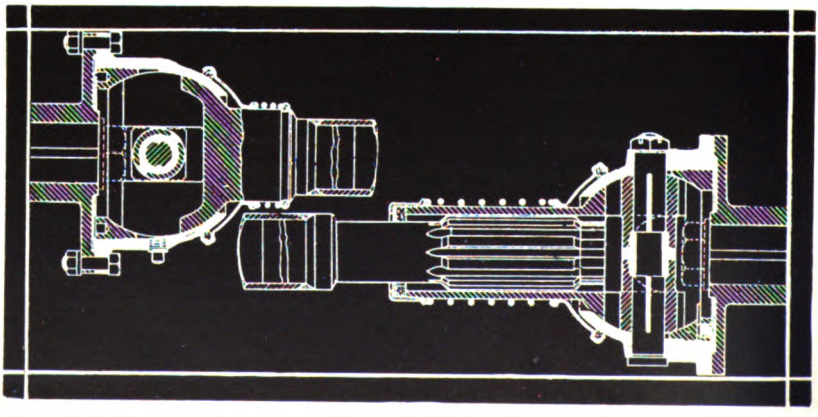
Your universal requirements will be best filled by the

LONG SURFACE—LONG SERVICE

universal designed and constructed to withstand a load greatly in excess of its rating.

THE WALKER JOINT COMPANY

1613 DIME BANK BUILDING **DETROIT, MICH.**



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103,000 Cars Are Stolen Annually

QUAYLE
KEYLESS AUTO LOCK

Every Theft Makes New Live Quayle Lock Prospects

How to Attach and Use
QUAYLE Keyless Auto Lock for Ford Cars

The switch-head which is built with every Ford car has the wires correctly connected. To attach the lock, remove the switch lever and the metal plate which covers the switch and held by three round-headed screws and discard them. Proceed as follows:

1. Switch-head is held to coil box by three small stove bolts. Remove the top one, place coils back in box and screw the 1½ inch wood screw furnished through the stove-bolt hole and in between the coils, thus preventing the coils from being lifted.

2. Place lever socket in position on center post of switch with prongs up.

3. Cover switch-head with nickel-plat d shield and secure same with the three flat-head screws furnished.

4. Turn false bottom numbered "sixteen" on lock to right to a horizontal position, place lip at bottom of lock through slot at bottom of shield, hold lock firmly against shield and turn button sixteen back to a perpendicular position. (When locked button 16 cannot be turned.

5 Insert switch lever and lock is installed. Turn to left for battery connection and to right for magneto. (If it is desired to withdraw switch lever for any reason and leave car locked, turn lever to left until notch on lock face is reached, lift lever through notch and turn switch back to neutral then withdraw lever and push down lug at top. To open, touch combination and insert lever in same manner as you withdraw it.)

$5 in 5 Minutes

—will install on any 1914, '15 or '16 Ford car, an absolutely thiefproof QUAYLE Keyless Auto Lock, on a money-back guarantee.

QUAYLE consumer advertising creates the demand that makes good profits from—

Liberal Dealers' Discounts on Sales to a Million Prospects

Costs dealers $3.50. Sells for $5. *Guaranteed for Life.*

There's a permanent money-back with every QUAYLE Lock. If it ever fails *we* will refund your full purchase price. But the QUAYLE Lock won't fail. Car can be operated only when proper buttons are pressed simultaneously, and there are 30,000 possible combinations for each lock. No thief has time to steal a QUAYLE-locked Ford.

The QUAYLE Lock controls the ignition *without disturbing a single wire.* Easily attached by anyone who can use a screw driver. A big favorite with the trade—at the right price. Dealers everywhere are making money where QUAYLE Keyless Auto Locks are in stock, and there is territory not yet covered where Ford cars by hundreds are waiting for the right kind of a lock to prevent theft. $5 is a small fee to save even the oldest Ford car.

$1.50 *cleared on every Ford in the territory—without installation service to reduce profits—is good money for filling a ready-made demand.*

If your regular jobber cannot take care of your requirements on our products, write us and we will see that some jobber does. *We guarantee prompt delivery.*

Quayle Manufacturing Co.
20 W. Jackson Blvd. Chicago, Ill.

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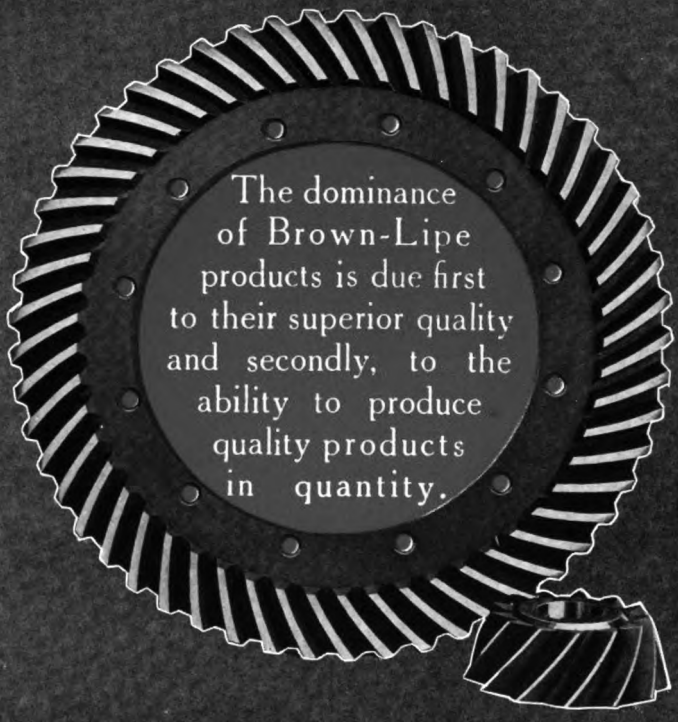
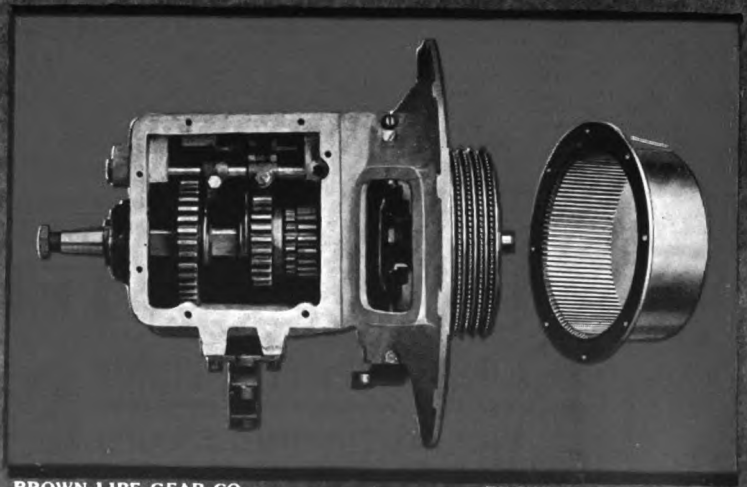


BROWN-LIPE



BROWN-LIPE GEAR CO.
Transmissions

BROWN-LIPE CHAPIN CO.
Differentials

Syracuse, N. Y., U. S. A.

NEW YORK
Thos. J. Wetzel
29 West 42nd St.

CHICAGO
K. Franklin Peterson
122 So. Michigan Ave.

DETROIT
L. D. Bolton
2215 Dime Savings Bank Bldg.

SAN FRANCISCO
A. H. Coates
444 Market St.

Foreign Agent, Benjamin Whittaker, 2 Norfolk Street, Strand, London, W. C.

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ELECTRIC
GAS
OIL

LAMPS

of the Highest Quality

AT MODERATE COST

Dealers write for Catalog and Prices.

THE JNO. W. BROWN MFG. CO.
COLUMBUS, OHIO

FEDERAL MAZDA "C" HEADLIGHT BULBS
NATIONAL QUALITY

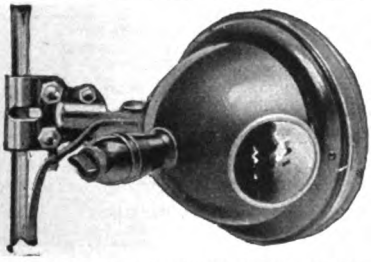
These gas filled bulbs are forty per cent more efficient, and give a whiter and more brilliant light than the vacuum type of bulb.

We have them ready for immediate delivery in 12, 21, 24 or 36 C.P. for 6-7 volts; or in 24 and 40 C.P. for 12-14 volts.

No delays in shipment. Write for prices and discounts.

FEDERAL MINIATURE LAMP DIVISION
National Lamp Works of General Electric Company
501 S. Jefferson Street, CHICAGO, ILL.

"OLD SOL" No. 70. Price $6.00 — Attach to either side of windshield



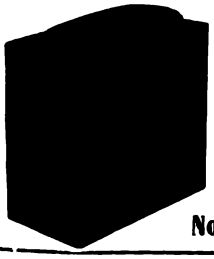
Side View No. 70, illustrating Mirror for daytime use and Focusing Device

A large handsome Spot Lamp which adds a touch of refined equipment to any car at a very reasonable price. 7 inch door and body all enameled. Mirror 3 inch size on lamp. Focusing device at rear of handle integral with switch. 6 volt 15 C. P. Bulb supplied as regular equipment. Special voltage bulbs on request. 6 feet of cable with copper terminals.

Front View No. 70, illustrating Searchlight Bulb

HAWTHORNE MFG. CO., Inc., 38 Spruce St., Bridgeport, Conn.

ORDER NORTHWESTERN



Batteries and Electric Lights

FOR AUTOMOBILES AND MOTOR BOATS

LIBERAL DISCOUNTS TO THE TRADE

Write for Catalogue "D".

Northwestern Storage Battery Co., Milwaukee, Wis.

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LAMPS (Continued)

OIL SIDE AND TAIL LAMPS (Continued)

BADGER Brass Mfg. Co., Lyman Ave., Kenosha, Wis. "Solar."

BOESCH Lamp Co., 1135 Mission St., San Francisco, Cal.

BROWN Mfg. Co., John W., Columbus, O. (See page 307.)

CHAMPION—See Dietz Co.

CORCORAN-VICTOR Co., Cincinnati, O. (See page 507.)

DAINTY—See Dietz Co.

DERBY—See Dietz Co.

DIETZ Co., R. E., 60 Laight St., New York, N. Y. "Dainty," "Royal," "Champion," "Royal Junior," "Derby," "Tourist."

DRESSEL Railway Lamp Works, 3360-30 Park Ave., New York, N. Y.

E & J—See Edmunds & Jones Corp.

EDMUNDS & Jones Corp., Detroit, Mich. "E. & J." (See page 321.)

GRAY & Davis, Boston, Mass. (See pages 483 to 486.)

HALL Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich.

HOFACKER Mfg. Co., 555 W. 42d St., New York, N. Y. (See page 293.)

INDIANA Lamp Co., Connersville, Ind. (See pages 446 and 447.)

NEVEROUT—See Rose Mfg. Co.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

ROYAL—See Dietz Co.

ROYAL JUNIOR—See Dietz Co.

SOLAR—See Badger Brass Mfg. Co.

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

TOURIST—See Dietz Co.

WIDMAN & Co., J. C., 14th & 15th Sts. & G. T. Ry., Detroit, Mich.

SIDE LAMPS

(See Lamps, Electric Side; also Lamps, Oil Side)

SWIVEL LAMPS

(For attachment to Wind Shields)

AUT-O-EYE—See Lipman Air Appliance Co.

B. & L. Auto Lamp Co., 534-50 W. 58th St., New York, N. Y. (See page 293.)

BADGER Brass Mfg. Co., Lyman Ave., Kenosha, Wis. "Solar."

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

CAMPBELL Co., A. S., 284 Commercial St., Boston, Mass. "Cello."

CELLO—See Campbell Co.

CORCORAN-VICTOR Co., Cincinnati, O. (See page 507.)

CULVER-STEARNS Mfg. Co., Detroit, Mich. (See page 699.)

EXCELITE—See Newfield Silver Mfg. Co.

FOSTER Accessories Co., C. H., 2303 Michigan Ave., Chicago, Ill. "Owl Light." (See page 309.)

HAWTHORNE Mfg. Co., 38 Spruce St., Bridgeport, Conn. "Old Sol." (See page 307.)

HOWE Mfg. Co., 57-61 E. 24th St., Chicago, Ill. (See page 745.)

INDIANA Lamp Co., Connersville, Ind. (See pages 446 and 447.)

KAUFMANN-WILLIAMS Lamp Co., Santa Ana, Cal. "Silverbeam."

KILBORN-SAUER Co., Fairfield, Conn. (See page 293.)

LIPMAN Air Appliance Co., 199 Pleasant St., Beloit, Wis. "Aut-O-eye."

NEWFIELD Silver Mfg. Co., State & Ash Sts., Bridgeport, Conn. "Excelite."

OLD SOL—See Hawthorne Mfg. Co.

OWL LIGHT—See Foster Accessories Co.

PITTSBURGH Electric Specialties Co., Ross & First Sts., Pittsburgh, Pa.

S & M Lamp Co., 117 W. 36th Pl., Los Angeles, Cal.

SILVERBEAM—See Kaufman Williams Lamp Co.

SOLAR—See Badger Brass Mfg. Co.

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

VICTOR Auto Parts Co., Second & Elm Sts., Cincinnati, O.

WOOD Mfg. Co., Dept. M., Fairfield, Conn. (See pages 300, 301 and 857.)

TAIL LAMPS

(See Lamps, Electric Side and Tail; also Lamps, Oil, Side and Tail)

TUNGSTEN LAMPS

(See Lamps, Miniature Tungsten)

LAVA

AMERICAN Lava Co., Chattanooga, Tenn.

STEWARD Mfg. Co., D. M., Chattanooga, Tenn.

LEATHER

ARTIFICIAL OR IMITATION LEATHER

BARRELL Co., Wm. L., New York, N. Y. "Styma," "Leathercoat." (See page 319.)

BRONCHO—See Zapon Leather Cloth Co.

BULL DOG—See Mutty Co.

CHASE & Co., L. C., Boston, Mass. (See page 313.)

Complete Index to Classification appears on Pages 8 to 27.

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PRICE SCHEDULE—DAVIS TUNGSTEN AUTOMOBILE LAMPS

FOR AUTOMOBILE SERVICE

Customers are requested to order in Unit Package Quantities to facilitate prompt deliveries.
Standard package quantity, 100 lamps.
Fitted with either double contact (Style 1000) or single contact (Style 1100) Bayonet Candelabra Base.
Can be supplied fitted with Candelabra Screw Base (Style 500) without extra charge.

Description	Candle-power	Volts	Type of Bulb	List Price Clear
LAMPS FOR MAGNETO TYPE LIGHTING SYSTEMS				
Headlight (Focusing—two in series).....	15	9	G-16½	$0.27
TYPES REGULARLY CARRIED IN STOCK FOR 6 AND 7 VOLT LIGHTING SYSTEMS				
Rear and Speedometer (Series Burning)....	2	3—3½	G-6	$0.21
Rear and Speedometer.	2	6—7	G-6	.21
Side.....	4	6—7	G-8	.21
Side.....	6	6—7	G-10	.24
Headlight (Focusing)..	12 & 15	6—7	G-12	.27
Headlight (Focusing)..	12	6—7	G-16½	.27
Headlight (Focusing)..	15 & 18	6—7	G-16½	.27
LAMPS FOR 12 & 14 VOLT LIGHTING SYSTEMS				
Rear and Speedometer (Series Burning)....	2	6—7	G-6	$0.21
Rear and Speedometer.	2	12—14	G-6	.24
Side.....	4	12—14	G-8	.24
Headlight (Focusing)..	15 & 18 & 21	12—14	G-16½	.30
LAMPS FOR 18—21 VOLT LIGHTING SYSTEMS				
Rear and Speedometer (Series Burning)....	2	9—10	G-6	$0.30
Rear and Speedometer.	2	18—21	G-6	.35
Side.....	4	18—21	G-8	.40
Headlight (Focusing)..	21	18—21	G-16½	50

DAVIS TUNGSTEN LAMP WORKS, Union Hill, N. J.
DISCOUNTS ON APPLICATION

THE SEARCHLIGHT DE LUXE

FOSTER OWL LIGHT

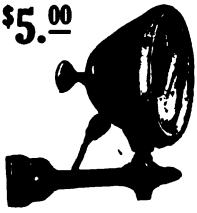
It's never lost a customer! A thoroughbred, built to feel at home on America's finest cars. Constructed to stand the gaff of most abusive service. Will outlast two or three cheap searchlights. The *standard* searchlight by which all others are gauged. Used by discriminating car owners everywhere. In the service of the European armies who consider the best obtainable just good enough.

Has patented Foster Universal Swivel Joint—only searchlight joint of its kind. Slip-proof, rattle-proof. Fastens on windshield of any car or may be installed on foredoor.

Responsible accessory dealers wanted. Good discounts.

In ordering, state make, model and battery voltage of car.

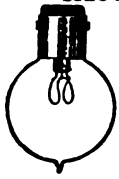
$5.00



C. H. Foster Accessories Co.
2303 Michigan Ave.
Chicago

Domestic Tungsten Automobile Lamps

Side Lights



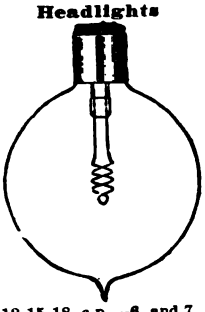
4 c.p.—6 and 7 volts—1 inch bulb

6 c.p.—6 and 7 volts—1 inch bulb

Limousine Light

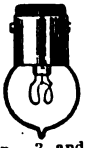
3 and 4 c.p.—6 and 7 volts—1 inch bulb

Headlights



12-15-18 c.p.—6 and 7 volts—1 inch bulb

Rear and Speedometer Light



2 c.p.—3 and 3½ volts (series burning), 6 and 7 volts (regular)—¾ inch bulb.

We specialize in the manufacture of a complete line of high grade wire drawn tungsten bulbs for automobile lighting of high efficiency and also for dry cell circuits.

DOMESTIC TUNGSTEN LAMP CO.
West New York, N. J.
QUALITY SERVICE DELIVERY PRICE

ALGCo PRODUCTS

Leather	Felt
GASKETS	WASHERS
WASHERS	GASKETS
SHIMS	STRIP TRIMMINGS
FAN BELTS	MECHANICAL ACCESSORIES
DISCS	SHEET
CASES	
ACCESSORIES	
CUPS	

Leather and Felt Goods of Quality

Our Prices and Service are Right

Auburn Leather Goods Co.
Auburn, N. Y.

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LEATHER (Continued)

ARTIFICIAL OR IMITATION LEATHER (Continued)

CHICAGO Decorative Leather Co., 426 S. Clinton St., Chicago, Ill. "Elkide."

COTEX Co., 341 Oliver St., Newark, N. J.

DU PONT Fabrikoid Co., Wilmington, Del. "Fabrikoid," "Rayntite."
(See page 311.)

DURATEX Co., 768 Frelinghuysen Ave., Newark, N. J.

EL-KIDE—See Chicago Decorative Leather Co.

FABRIKOID—See Du Pont Fabrikoid Co.

GOTHAM—See Zapon Leather Cloth Co.

KERATOL Co., South & Van Buren Sts., Newark, N. J.

LEATHERCOAT—See Barrell Co.

MAROKENE Co., 6 Fletcher St., New York, N. Y.

MOROCCOLINE—See Zapon Leather Cloth Co.

MULESKIN—See Zapon Leather Cloth Co.

MUTTY Co., L. J., Boston, Mass. "Bull Dog."
(See page 271.)

O'BANNON Corp., 200 Fifth Ave., New York, N. Y.
(See page 311.)

PANTASOTE Co., 11 Broadway, New York, N. Y.

RANDCO—See Zapon Leather Cloth Co.

RAYNTITE—See Du Pont Fabrikoid Co.

STYMA—See Barrell Co.

TEXTILEATHER Co., 212 Fifth Ave., New York, N. Y.

ZAPON Leather Cloth Co., 200 Fifth Ave., New York, N. Y. "Moroccoline," "Broncho," "Muleskin," "Randco," "Gotham."

FRICTION LEATHER

(For lining brakes and clutches—See also Banding Brake; also Belting, Leather; also Fibre, Hard)

AMERICAN Belting & Tanning Co., 135 Oliver St., Boston, Mass.

BONNER & Barnewell, 30 Church St., New York, N. Y.

BRACE Leather Goods Co., 22 Wayne St., Pontiac, Mich.

CHICAGO Belting Co., 113-25 N. Green St., Chicago, Ill.

CHICAGO Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.

COE & Brown, 202-04 George St., New Haven, Conn.

DETROIT Leather Specialty Co., 275 Beecher Ave., Detroit, Mich.

DUCKWALL Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

EXCELMO—See Missouri Belting Co.

G & K—See Graton & Knight Mfg. Co.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K."
(See page 103.)

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind. "Wetprufe," "Leathertex."
(See page 789.)

HOUGHTON & Co., E. F., 240 W. Somerset St., Philadelphia, Pa. "Vim."

HUDSON Belting Co., 1-8 Eaton Pl., Worcester, Mass.

JEWELL Belting Co., 55 Trumbull St., Hartford, Conn.

LEATHERTEX—See Hide, Leather & Belting Co.

M.L.B.—See Milwaukee Leather Belting Co.

MAU-SHERWOOD Supply Co., 1616 W. Third St., Cleveland, O. "Suregrip."

MILWAUKEE Leather Belting Co., 146 W. Water St., Milwaukee, Wis. "M L B."

MISSOURI Belting Co., Grand Ave. & La Salle St., St. Louis, Mo. "Excelmo."

NATIONAL Leather Belting Co., 342 E. 38th St., New York, N. Y.

NATIONAL Leather Mfg. Co., Niles, Mich.

NEW York Leather Belting Co., 465 Kent Ave., Brooklyn, N. Y.

PAGE Belting Co., Concord, N. H.

PROVIDENCE Belting Co., 25 Charles St., Providence, R. I.

RAHMANN & Co., Geo., 31 Spruce St., New York, N. Y.

SCHIEREN Co., Chas. A., 30 Ferry St., New York, N. Y.

SHULTZ Belting Co., 402 Barton St., St. Louis, Mo.

SUREGRIP—See Mau-Sherwood Supply Co.

TAYLOR Belting Co., 247 S. Meridian St., Indianapolis, Ind.

VIM—See Houghton & Co.

WETPRUFE—See Hide, Leather & Belting Co.

WILLIAMS & Sons, I. B., Dover, N. H.

NATURAL LEATHER

AMERICAN Leather Mfg. Co., Newark, N. J.

AMERICAN Oak Leather Co., Cincinnati, O.

ARROW—See Ryan Leather Co.

ASHTABULA Hide & Leather Co., Ashtabula, O.

ATLANTIC Leather Co., 178 Wright St., Newark, N. J.

BADGER State Tanning Co., Sheboygan, Wis.

BEAVER—See Straus & Sons, M.

BLANCHARD Bro. & Lane, 20 Bruen St., Newark, N. J.

BOULEE-FRAZER Leather Co., New York, N. Y.
(See pages 300 and 301.)

BRIDGEPORT Patent Leather Mfg. Co., 199 Cannon St., Bridgeport, Conn. "Charter Oak."

BYRON & Sons, W. D., Williamsport, Md. "Tanok."

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CHARTER OAK—See Bridgeport Patent Leather Mfg. Co.

CLEVELAND Tanning Co., Jennings & Dennison Aves., S. W., Cleveland, O.

EAGLE—See Reilly Co.

EAGLE-OTTAWA Leather Co., 226-28 W. Lake St., Chicago, Ill.

GENERAL Leather Co., Newark, N. J.

GOOD, R. C. & H. B., Newark, N. J.

HERTZ, Max, 54-68 Oliver St., Newark, N. J.

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REG U S. PAT OFF

RAYNTITE
Top Materials

HAVE demonstrated their superiority by actual service on thousands of cars.

RAYNTITE has been adopted as the standard weatherproof topping material by the leading manufacturers, thus confirming our claim for its merits.

RAYNTITE, single or double texture is handsome, does not fade, warp or balloon when in place on your car.

When buying a new car or re-topping your present car, specify Rayntite Top Material.

Our Guarantee

Rayntite is sincerely warranted waterproof for one year's service, but made to wear the life of your car.

Samples on Request.

Du Pont Fabrikoid Co.
Wilmington, Del.
Canadian Factory and Office: Toronto, Ont.

MOLESKIN QUALITY
The Superior Leather Substitute

O'BANNON LEATHER
REG. U.S. PAT. OFF.

OTHER QUALITIES SUITABLE FOR ALL TRIMMING PURPOSES

O'BANNON CORPORATION
200 FIFTH AVENUE, NEW YORK

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LEATHER (Continued)

NATURAL LEATHER (Continued)

HOWELL & Co., T. P., New & Nuttmann Sts., Newark, N. J. "Lion."

HOWELL-HINCHMAN Co., Middletown, N. Y.

JOHNSON Leather Co., 768 Frelinghuysen Ave., Newark, N. J.

KELLY & McLaughlin, Newark, N. J.

KLAUDER, Chas. L., Philadelphia, Pa.

LACKAWANNA Leather Co., Hackettstown, N. J.

LANG Co., Henry, Newark, N. J.

LION—See Howell & Co.

MENTZ, John J., Newark, N. J.

OHIO Tanning Co., Cincinnati, O.

PEARCE Bros. Leather Co., Newark, N. J.

RADEL Leather Mfg. Co., Hamburg Place Rd., Newark, N. J.

RASER Tanning Co., Ashtabula, O.

REILLY Co., John, Ave. C & Murray St., Newark, N. J. "Eagle."

REILLY & Son, P., Mott St. & Passaic Ave., Newark, N. J. "Stag."

ROSER & Son, Hermann, Glastonbury, Conn.

RYAN Leather Co., 28-34 Ferdon St., Newark, N. J. "Arrow."

SHIELDS Bros., Bombay, N. Y.

SMITH & Sons, L. M., 59 Lock St., Newark, N. J.

SMYTH Co., Charles, 240-50 Central Ave., Newark, N. J.

STAG—See Reilly & Son.

STANDARD Leather Co. of Pittsburg, 296 Spring Garden Ave., N. S. Pittsburg, Pa.

STENGEL, Geo., Frelinghuysen & Elizabeth Aves., Newark, N. J.

STENGEL & Rothschild, Maine & Kossuth Sts., Newark, N. J.

STRAUS & Sons, M., 440 Frelinghuysen Ave., Newark, N. J. "Beaver."

TANOK—See Byron & Sons.

TERWILLIGER-VINCENT Leather Co., 173 Wright St., Newark, N. J.

TURNER & Rutter, 82 Spruce St., New York, N. Y.

WILDER Tanning Co., Waukegan, Ill.

WING Co., Charles, Amesbury, Mass. (Dealers.)
(See page 857.)

RAWHIDE LACE LEATHER

(For preventing motor hoods or bonnets from rattling)

CHICAGO Belting Co., 113-25 N. Green St., Chicago, Ill.

CHICAGO Rawhide Mfg. Co., 1801 Elston Ave., Chicago, Ill.

COCHECO—See Williams & Son.

DEFIANCE—See Norwich Belt Mfg. Co.

DUCKWALL Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

EAGLE—See Mooney Belting Co.

G & K—See Graton & Knight Mfg. Co.

GAY, Fred E., Olneyville, R. I.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K."
(See page 103.)

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind.
(See page 789.)

JEWELL Belting Co., 55 Trumbull St., Hartford, Conn.

MISSOURI Belting Co., Grand Ave. & La Salle St., St. Louis, Mo. "Victor."

MOONEY Belting Co., 344 W. Sixth St., Cincinnati, O. "Eagle."

NATIONAL Leather Belting Co., 342 E. 38th St., New York, N. Y.

NATIONAL Leather Mfg. Co., Niles, Mich.

NEW York Leather Belting Co., 465 Kent Ave., Brooklyn, N. Y.

NORWICH Belt Mfg. Co., Norwich, Conn. "Defiance."

RAHMANN & Co., Geo., 81 Spruce St., New York, N. Y.

RICHMOND Leather Mfg. Co., 2201-07 E. Cary St., Richmond, Va.

SHULTZ Belting Co., 402 Barton St., St. Louis, Mo.

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal.

VICTOR—See Missouri Belting Co.

WEATHERHEAD-THOMPSON Co., Pawtucket, R. I.

WILLIAMS & Sons, I. B., Dover, N. H. "Cocheco."

LEGGINGS

MOTORISTS LEGGINGS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. "Reliance," "Napoleon," "Tooinone," "Universal," "Boulevard," "Harvard," "National.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BOULEVARD—See Atlas Specialty Mfg. Co.

COOK & Bro., E. C., 1801-45 Carroll Ave., Chicago, Ill.

HAGERSTOWN Shoe & Legging Co., Hagerstown, Md. "Halco."

HALCO—See Hagerstown Shoe & Legging Co.

HARVARD—See Atlas Specialty Mfg. Co.

NAPOLEON—See Atlas Specialty Mfg. Co.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NATIONAL—See Atlas Specialty Mfg. Co.

PREMIER Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

RELIANCE—See Atlas Specialty Mfg. Co.

SYRACUSE & Eldridge Glove & Legging Co., 107 N. Franklin St., Syracuse, N. Y.

TOOINONE—See Atlas Specialty Mfg. Co.

UNIVERSAL—See Atlas Specialty Mfg. Co.

WILEY & Son Co., Wm. H., 30 Pliny St., Hartford, Conn.

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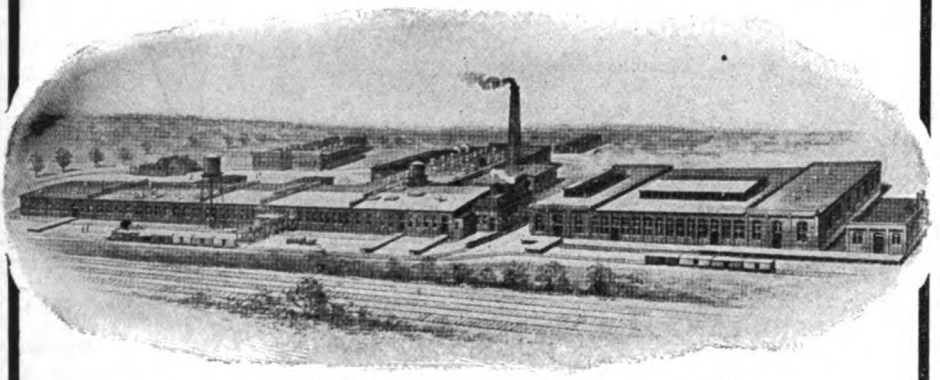
Chase Top Fabrics

For Automobiles & Carriages



The Chase Top Material Factories

The place where reputation dove-tails with quality and price.

Genuine Mohair Mackintosh Cloth

Chase Artificial Leather

(The world's standard leather substitute)

Chase Rubber Cloths

It will be worth time and money to you to investigate the CHASE line when purchasing top materials, because our prices are right, quality is unequalled, and we mean to sustain our reputation.

L. C. CHASE & CO.

BOSTON NEW YORK CHICAGO DETROIT SAN FRANCISCO

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LEVERS

BRAKE AND GEAR SHIFT LEVERS

(Finished or Machined Levers. For Levers in the rough—See Castings; also Forgings)

BILLINGS & Spencer Co., Hartford, Conn.

BROWN-LIPE Gear Co., Syracuse, N. Y. (See page 306B.)

COTTA Gear Co., 117-29 Morgan St., Rockford, Ill.

COTTA Transmission Co., 814-18 S. Main St., Rockford, Ill. (See page 253.)

DRIGGS-SEABURY Ordnance Co., Sharon, Pa. (See page 363.)

FULLER & Sons Mfg. Co., Kalamazoo, Mich.

HAZARD Motor Mfg. Co., 28 Scherer St., Rochester, N. Y.

HOOSIER Auto Parts Co., Muncie, Ind.

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

PIPER Machine Co., 560-70 N. Elder Ave., Indianapolis, Ind.

WABASH Gear Works, Tenth & Farrington Sts., Terre Haute, Ind.

WARNER Co., T. W., Kilgore & Perkins Aves., Muncie, Ind.

WARNER Gear Co., Muncie, Ind. (See page 315.)

LIGHTERS

ACETYLENE LAMP LIGHTERS

(See also Burners, Special Acetylene Lamp)

ADJUSTABLE Lighter Co., 18 Pearl St., Newton, Mass.

ADVANCE Motor Specialties Co., 501 Plymouth Pl., Chicago, Ill. "Matchless."

FEESER Co., Frank S., 1102 Prospect St. Indianapolis, Ind. "Superior."

G. C. A. Mfg. Co., Agricultural Bank Bldg., Pittsfield, Mass. "Lectrogas."

IDEAL Brass Works, Tenth & Canal Sts., Indianapolis, Ind.

LECTROGAS—See G. C. A. Mfg. Co.

MATCHLESS—See Advance Motor Specialties Co.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

ROUSSEAU, David, Ossining, N. Y.

SAFETY Gas Lighter Co., 48 Phoenix Row, Haverhill, Mass.

SEARCHLIGHT Co., 1016 Karpen Blvd., Chicago, Ill.

SUPERIOR—See Feeser Co.

ELECTRIC CIGAR LIGHTERS

CENTURY—See Mabeys Electric & Mfg. Co.

COWLES & Co., C., New Haven, Conn. (See page 257.)

ELECTRIC Automatic Cigar Lighter Co., 556 W. 27th St., New York, N. Y.

GOHRING—See Taylor Co.

MABEYS Electric & Mfg. Co., 940 N. Pennsylvania St., Indianapolis, Ind. "Century."

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto." (See page 257.)

MORSE, Frank W., 293 Congress St., Boston, Mass. (See page 517.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

PRESTO—See Metal Specialties Mfg. Co.

RUSSELL & Co., T. F., 170 Summer St., Boston, Mass.

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y. "Gohring."

OIL LAMP LIGHTERS

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

LIGHTS

ELECTRIC DOME LIGHTS

CAMPBELL Co., A. S., 284 Commercial St. Boston, Mass. "Cello."

CELLO—See Campbell Co.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

COWLES & Co., C., New Haven, Conn. (See page 257.)

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven Conn.

EXCELITE—See Newfield Silver Mfg. Co.

FAWSCO—See Faw, J. H.

FAW, J. H., 41 Warren St., New York, N. Y. "Fawsco." (See page 845.)

GUIDE Motor Lamp Mfg. Co., Cleveland, O. (See page 291.)

HOFACKER Mfg. Co., 555 W. 42d St., New York, N. Y. (See page 293.)

HOLT & Beebee Co., 51 Chardon St., Boston, Mass.

HUDSON-FULTON—See Storage Battery Supply Co.

LIBERTY Cut Glass Works, Egg Harbor City, N. J. (See page 269.)

NEWFIELD Silver Mfg. Co., State & Ash Sts., Bridgeport, Conn. "Excelite."

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco." (See page 183.)

STORAGE Battery Supply Co., 289 E. 27th St., New York, N. Y. "Hudson-Fulton."

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y.

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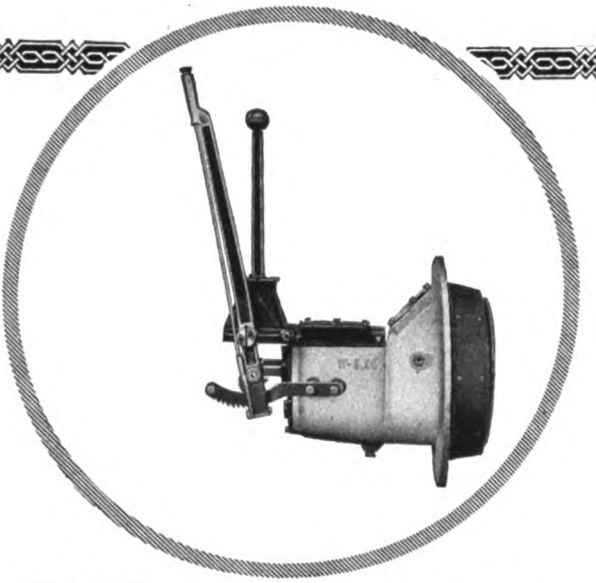

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"THE RECOGNIZED STANDARD"

for TRANSMISSIONS, DIFFERENTIALS, STEERING GEARS, CLUTCHES, CONTROLS

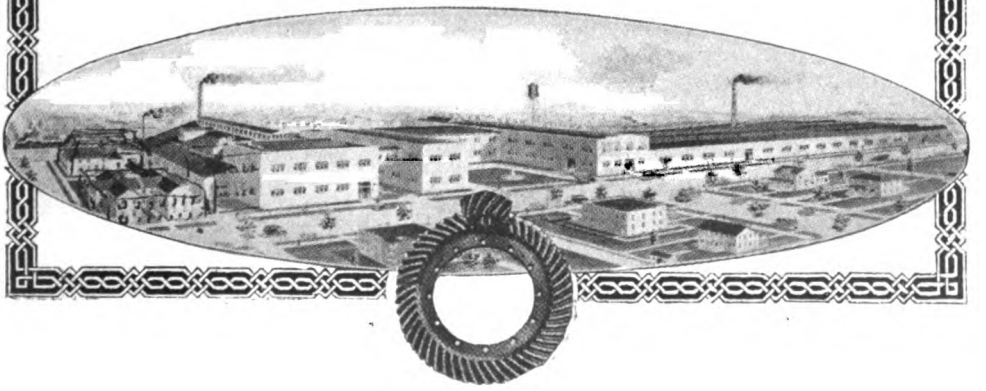
Produce something better—is the constant demand made by the WARNER Specialists, on an organization developed to the highest degree of perfection—backed by the most modern plant and equipment.

WARNER GEAR CO. Products in a car give the owner that feeling of satisfaction, dependability and security that can only come with—**perfect service.**

The wise manufacturer builds this perfect service into his car.

WARNER GEAR COMPANY, Muncie, Ind.

Detroit Office: 967 Woodward Ave.



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LIGHTS (Continued)

ELECTRIC DOME LIGHTS (Continued)

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

ELECTRIC FLASHLIGHTS AND LANTERNS

BURLEIGH, Geo. K., Penacook, N. H. "Fire Fly."

DA-LITE—See Halladay Co.

DAD'S—See Hytee's Factories.

DELTA Electric Co., 313-405 E. Fourth St., Marion, Ind.

FEDERAL Sign System, Lake & Desplaines Sts., Chicago, Ill.

FIRE FLY—See Burleigh, Geo. K.

FRENCH Battery & Carbon Co., Madison, Wis.

HALLADAY Co., L. P., Streator, Ill. "Da-Lite."

HYTEE'S Factories, Murphy Mfg. Bldg., Indianapolis, Ind. "Dad's."

KWIK-LITE—See Usona Mfg. Co.

LIGHTNING BUG—See Stewart-Skinner Co.

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto" (See page 257.)

O-U-LYTE—See Weder Co.

PRESTO—See Metal Specialties Mfg. Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. (See page 183.)

STEWART-SKINNER Co., 17 Green St., Worcester, Mass. "Lightning Bug."

USONA Mfg. Co., 1 Hudson St., New York, N. Y. "Kwik Lite."

WEDER Co., 4545 Germantown Ave., Philadelphia, Pa. "O-U-Lyte."

ELECTRIC GAGE LIGHTS

(See Lamps, Electric Dash)

ELECTRIC HEADLIGHTS

(See Headlights, Electric)

WASH STAND LIGHTS

(For lighting car on wash stand)

ALADDIN—See Smith Mfg. Co.

MULLER, Edward, 1304 John St., West New York, N. J. (See page 567.)

SMITH Mfg. Co., I. J., 1007 Ave. Q. Brooklyn, N. Y. "Aladdin."

LINING

BODY OR FRAME LINING

AMERICAN Mills Co. of New York, 395 Broadway, New York, N. Y. (See page 321.)

GILMER Co., L. H. (Tacony), Philadelphia, Pa. (See page 105.)

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind. (See page 789.)

HORTON Mfg. Co., F. L., 36 Whittier St., Roxbury, Mass. (See page 727.)

RUSSELL Mfg. Co., Middletown, Conn. (See page 811.)

WESTERN Felt Works, 4115-33 Ogden Ave., Chicago, Ill. (See page 565.)

BRAKE LINING

(See Banding, Brake; also Leather, Friction; also Fibre, Hard)

LINOLEUM

AMERICAN Linoleum Mfg. Co., 366 Fifth Ave., New York, N. Y.

ARMSTRONG Cork Co., 124 23d St., Pittsburg, Pa. (See page 187.)

BLABON Co., Geo. W., 21st St. & Hunting Park Ave., Philadelphia, Pa.

COOK'S Linoleum Co., Trenton, N. J.

LIN-RHUBER—See Nairn Linoleum Co.

NAIRN Linoleum Co., Newark, N. J. "Lin-Rhuber." (See page 317.)

POTTER, Sons & Co., Thomas, Second & Erie Sts., Philadelphia, Pa.

RINGWALT Linoleum Works, 230 Fifth Ave., New York, N. Y.

LOADERS

GREASE GUN LOADERS

COLSON, H. H., 3225 Dickens Ave., Chicago, Ill. "Handy."

HANDY—See Colson, H. H.

TRUCK LOADERS

ECLIPSE—See Galion Iron Works & Mfg. Co.

GALION Iron Works & Mfg. Co., Galion, O. "Eclipse."

LINK-BELT Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 155.)

LOCKS

AUTOMOBILE LOCKS

(For Locking Steering Gears or Gear Levers; For Lock Switches—See Switches, Electric Lock; For Lock Valves—See Valves, Gasoline Lock)

A. B. & B. Specialty Co., 764 Windlake Ave., Milwaukee, Wis.

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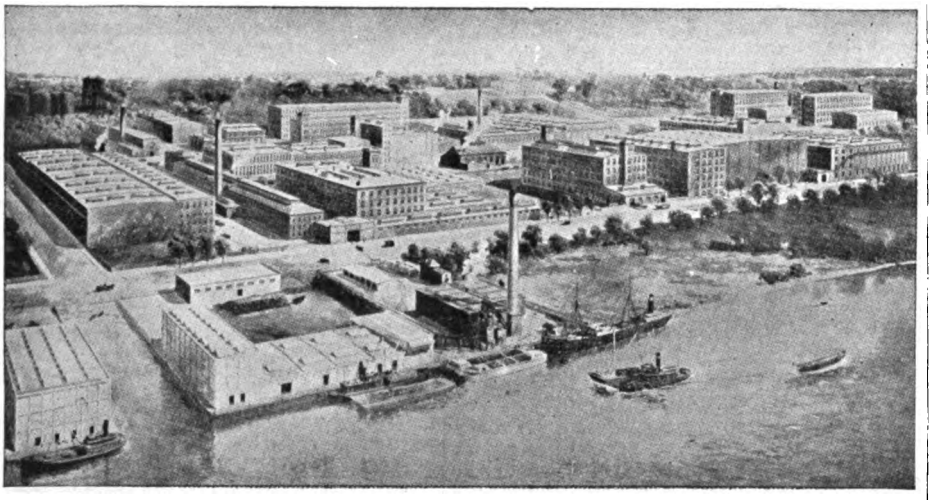
NAIRN LINOLEUMS



Nairn Linoleums make the most satisfactory surface for floors and running boards of **Automobiles and Motor Boats.**

Large stocks carried at the Mill, Newark, N. J., and also at our warehouses in Chicago, St. Louis, Kansas City, Denver, Galveston, San Francisco, Los Angeles, Seattle, Portland, Ore.

The Nairn Linoleum Company

Newark, N. J.

W. & J. SLOANE

Sole Selling Agents

573 Fifth Ave., New York

216-18 Sutter St. San Francisco

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LOCKS (Continued)

AUTOMOBILE LOCKS (Continued)

AUTO-SAFE—See French, Charles A.

AUTOLOC—See Slaymaker Lock Mfg. Corp.

B. & E. Lock Co., 318 Seventh St., Des Moines, Ia.

BACKUS Novelty Co., 612 Water St., Smethport, Pa.

BENHAM—See Shroyer & Co.

BRODERICK & Bascom Rope Co., 817 N. Second St., St. Louis, Mo. "Powersteel Autowlock."

COMMERCIAL Mfg. Co., 405 Commercial Bldg., Cleveland, O.
(See page 319.)

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

CORONUM Equipment Co., 110 Fulton St., New York, N. Y.

FRENCH, Charles A., 2543-45 E. Johnson St., Madison, Wis. "Auto-Safe."
(See page 619.)

GENERAL Utility Co., 1326-30 Ogden St., Philadelphia, Pa. "Parker."

GUARDIAN—See Mechanical Products Co.

HANDEE—See Racine Handy Mfg. Co.

LAWRENCE Specialty Co., Boston, Mass.

MECHANICAL Products Co., Citizens Bldg., Cleveland, O. "Guardian."

NORTH Side Buick Sales Co., 918-26 Sheridan Rd., Chicago, Ill.

PARKER—See General Utility Co.

PARKIN & Son, 2417 N. Broad St., Philadelphia, Pa.

POWERSTEEL AUTOLOCK—See Broderick & Bascom Rope Co.

RACINE-HANDY Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."
(See page 621.)

ROBE Lock Co., 1853-38th Ave., Oakland, Cal.

ROCHESTER Safety Lock Co., 530 Main St., Rochester, Ind.

SHROYER & CO., G. W., 102-06 Main St., N. Dayton, O. "Benham."

SLAYMAKER Lock Mfg. Corp., 808-70 First St., Lancaster, Pa. "Autoloc."

WELCH Bros., Pontiac, Mich.

CABINET AND PADLOCKS

AMERICAN Keyless Lock Co., 628 W. Jackson Blvd., Chicago, Ill.

BAIRD Equipment Co., 325 W. Ohio St., Chicago, Ill.
(See page 861.)

CHICAGO Cabinet Lock Co., Lake View Station, Chicago, Ill.
(See page 319.)

CORBIN Cabinet Lock Co., New Britain, Conn.

EAGLE Lock Co., Terryville, Conn.

JUNKUNC Bros., 76th & Wallace St., Chicago, Ill.

KEYSTONE Lock Co., Park Ave. & Jefferson St., Lancaster, Pa.

SARGENT & Co., Water & Wallace Sts., New Haven, Conn.

SLAYMAKER Lock Mfg. Corp., 808-70 First St., Lancaster, Pa.

YALE & Towne Mfg. Co., 9 E. 40th St., New York, N. Y.
(See page 319.)

DOOR LOCKS

ÆTNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

AMERICAN Brass Novelty Co., Grand Haven, Mich.

APPLEBY & Co., W. H., 224 N. Desplaines St., Chicago, Ill.

COWLES & Co., C., New Haven, Conn.
(See page 257.)

DOUGLAS & Lomason Co., Detroit, Mich.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

MITCHELL Specialty Co., 2009 Market St., Philadelphia, Pa.

OCHSNER & Sons Co., A., 1060 State St., New Haven, Conn.

PARSONS Mfg. Co., 21st & Fort Sts., Detroit, Mich.

SEARIGHT-DOWNS Mfg. Co., 45 E. Fort St., Detroit, Mich.

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

LOOPS

BRASS SNAP AND STRAP LOOPS

(See also Fittings, Top)

ANCHOR—See North & Judd Mfg. Co.

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

DESOCO—See Detroit Socket Co.

DETROIT Socket Co., 314 Jefferson Ave., W., Detroit, Mich. "Desoco."

DOUGLAS & Lomason Co., Detroit, Mich.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

JONAH & George, Merrimac, Mass.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

NORTH & Judd Mfg. Co., New Britain, Conn. "Anchor."
(See page 835.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y.
(See page 223.)

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

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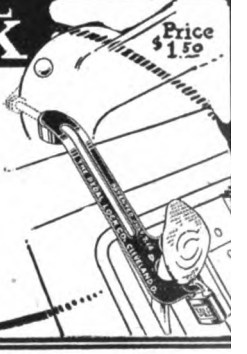
No. 1. Westcott 1915
No. 1. Harsted
No. 1: Sphinx A-15
No. 1. Stoddard-Dayton
No. 2. Stutz H. C. S.
No. 2. Marion
No. 6. Stearns 1911
No. 10. Imperial
No. 11. Hudson
No. 12. Krit 1912-1913
No. 11. Interstate
No. 9. Oakland 1913 [4-37] or [6-49]
No. 3. Oakland 1913-1914 [35]
No. 8. Studebaker 1913
No. 7. Studebaker [all others]
No. 5. Buick 1911 and 1912
No. 2. Jackson 1913-1914
No. 1. Jackson [all others]
No. 1. Cadillac 1910
No. 12. Cadillac 1911-1912-1913
No. 4. Cole 1913-1914-1915 Six
No. 4. Cole 1916 Four
No. 11. Jeffery 1914-1915-1916 Ford, any Model T Ford



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OILS AND GREASES

(See Oils, Lubricating; also Greases, Cup and Gear)

LUBRICATORS

HAND LUBRICATORS OR OIL PUMPS

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (See page 717.)

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

LUNKENHEIMER Co., 228 E. Eighth Ave., Cincinnati, O.

MECHANICAL LUBRICATORS OR OIL PUMPS

(Engine driven Oil Pumps)

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

DETROIT Lubricator Co., Detroit, Mich. (See page 677.)

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

LAVIGNE Mfg. Co., 625-41 Commonwealth Ave., Detroit, Mich.

LEE Co., Wm. O., Port Huron, Mich.

LIPMAN Mfg. Co., 211 Pleasant St., Beloit, Wis.

LUNKENHEIMER Co., 228 E. Eighth Ave., Cincinnati, O.

McCORD Mfg. Co., Detroit, Mich. (See pages 418 and 419.)

MADISON-KIPP Lubricator Co., Madison, Wis.

MANZEL Bros. Co., 320 Babcock St., Buffalo, N.Y.

NEELY Mfg. Co., 829 Wells St., Chicago, Ill.

PEDERSEN Lubricator Co., 636 First Ave., New York, N. Y.

RICHARDSON-PHENIX Co., 122-28 Reservoir Ave., Milwaukee, Wis.

WEISS, L. T., 293 Taaffe Pl., Brooklyn, N. Y.

OIL AND GREASE CUP LUBRICATORS

(See Cups, Oil and Grease)

PRESSURE LUBRICATORS

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

PEDERSEN Lubricator Co., 636 First Ave., New York, N. Y.

W. H. Oil Saving Co., Lewiston, Idaho.

WILKINSON Co., Wm. H., West Medway, Mass.

LUGS

TIRE LUGS

CLARK Novelty Co., 350 Exchange St., Rochester, N. Y.

CRYDER & Co., 583 Park Ave., New York, N. Y. (Importers.) "Hermetic."

HERMETIC—See Cryder & Co.

LUMBER

AUTOMOBILE LUMBER

AGASOTE—See Pantasote Co.

ANDERSON-TULLY Co., Memphis, Tenn.

APPALACHIA Lumber Co., St. Bernard Station, Cincinnati, O.

BAKER Lumber Co., Turrell, Ark.

CARRIER Lumber & Mfg. Co., Sardis, Miss.

DARLING Lumber Co., J. W., Cincinnati, O.

EVANS Lumber Co., G. H., Chattanooga, Tenn.

GREBLE-SINE Lumber Co., Peoples Gas Bldg., Chicago, Ill.

HIMMELBERGER-HARRISON Lumber Co., Cape Girardeau, Mo.

HOFFMAN Bros. Co., 800 W. Main St., Fort Wayne, Ind.

INTERSTATE Lumber Co., The Arcade, Cleveland, O.

LAMB-FISH Lumber Co., Charleston, Miss.

LEONARD, H. R., Seaboard Bank Bldg., Norfolk, Va.

LOVE, Boyd & Co., ft. S. Second St., Nashville, Tenn.

LUEHRMANN Hardwood Lumber Co., Chas. F., 148 Carroll St., St. Louis, Mo.

MARTIN-BARRISS Co., 2048 W. Third St., Cleveland, O.

MOORE & McFerren, Memphis, Tenn.

NEW River Lumber Co., Union Trust Bldg., Cincinnati, O.

NORTH Vernon Lumber Co., Louisville, Ky.

PAEPCKE-LEICHT Lumber Co., 111 W. Washington St., Chicago, Ill.

PANTASOTE Co., 11 Broadway, New York, N. Y. "Vehisote," "Agasote."

PEITCH Co., F. T., 303 Superior Ave., W., Cleveland, O.

SHIELS & Co., Charles F., McLean Ave. & Gest St., Cincinnati, O.

SULLIVAN & Co., T., Niagara & Arthur Sts., Buffalo, N. Y.

TAUSSIG, L. J., Commercial Bldg., St. Louis, Mo.

THREE States Lumber Co., Memphis, Tenn.

VEHISOTE—See Pantasote Co.

WEST Virginia Timber Co., Charleston, W. Va.

YOUNG Lumber Co., 19 Edward St., Binghamton, N. Y.

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MACHINE WORK

SPECIAL MACHINE WORK TO ORDER

(See also Screw Machine Products)

A. B. & B. Specialty Co., 764 Windlake Ave., Milwaukee, Wis.

ADAPT Machinery Co., 1610 Wabash Ave., Chicago, Ill.

ADVANCE Machine Co., 654-58 Franklin St., Detroit, Mich.

ÆTNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ALEXANDER & Cox Co., Ogden & Western Aves., Chicago, Ill.

ALLEN & Curtiss Co., Mishawaka, Ind. (See page 807.)

AMERICAN Brass & Iron Co., Detroit, Mich. (See page 183.)

AMERICAN Die & Tool Co., Reading, Pa. (See page 673.)

AMERICAN Metal Products Co., Ampco Bldg., Milwaukee, Wis.

ASHLEY Machine Works, 724 University Ave., Rochester, N. Y. (See page 323.)

ATLAS Brass Foundry Co., 980-90 S. Front St., Columbus, O.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

AUTO Engine Works, St. Paul, Minn. (See page 219.)

AUTO Engineering Co., Detroit, Mich. (See page 167.)

AUTO Parts Mfg. Co., 443 Trombley Ave., Detroit, Mich.

BILLINGS & Spencer Co., Hartford, Conn.

BLACK & Decker Mfg. Co., 105 S. Calvert St., Baltimore, Md. (See page 737.)

BLAIR Tool & Machine Works, 521 Greenwich St., New York, N. Y.

BLAKE & Johnson Co., Waterbury, Conn.

BLANCHARD Machine Co., 64 State St., Cambridge, Mass.

BRIDGEPORT Engineering Co., Bridgeport, Conn.

BUDA Co., Harvey, Ill.

BULTMAN Co., F. H., 2103 Superior Viaduct, Cleveland, O.

BUNTING Brass & Bronze Co., 737 Spencer St., Toledo, O. (See page 335.)

CASSADY-FAIRBANK Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

CHICAGO-RACINE Aluminum, Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.

CLARK Novelty Co., 380 Exchange St., Rochester, N. Y.

CLEVELAND Ball-Bearing Co., Cleveland, O.

CLIMAX Machinery Co., 143-63 E. Morris St., Indianapolis, Ind.

CLINTON Machine Works, 460 High St., Clinton, Mass.

CONOVER-OVERKAMP Machine & Tool Co., 841 W. Germantown St., Dayton, O.

CURRIE & Son, J. B., 72 Adams St., Brooklyn, N. Y.

DE CAMP & Sloan Mfg. Co., 420 Ogden St., Newark, N. J.

DETLAFF, A. J., 121 E. Lafayette Ave., Detroit, Mich.

DETROIT Gear & Machine Co., Detroit, Mich. (See page 247.)

DETROIT Heating & Lighting Co., 340 Wight St., Detroit, Mich.

DETROIT Motor Casting Co., 299-303 Beaufait Ave., Detroit, Mich.

DIAMOND Stamping Works Co., 5400 Windsor Ave., Cleveland, O.

DIEBOLD Products Co., 5333-37 St. Clair Ave., Cleveland, O.

DITWILER Mfg. Co., Galion, O.

DRIGGS-SEABURY Ordnance Co., Sharon, Pa. (See page 363.)

EASTERN Machine & Stamping Co., 15 Wickenden St., Providence, R. I.

EDWARDS Co., B. V., 60 Shipman St., Newark, N. J.

FERRO Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

FORE River Shipbuilding Corp., Quincy, Mass.

FORT Dearborn Mfg. Co., Sterling, Ill.

FULLER & Sons Mfg. Co., Kalamazoo, Mich.

FULTON Mfg. Co., 1052 W. 12th St., Erie, Pa.

GARRIGUS Machine Co., C. G., 151 Riverside Ave., Bristol, Conn.

GARVIN Machine Co., Spring & Varick Sts., New York, N. Y.

GEIER Co., P. A., 5112 St. Clair Ave., E., Cleveland, O.

GILL & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y. (See page 669.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O. (See page 121.)

GOETZ Co., 1302 Clybourn Ave., Chicago, Ill.

GOODSPEED-DETROIT Mfg. Co., 272-30 Harper Ave., Detroit, Mich.

GRAND Machine Co., 3456 S. Grand Ave., St. Louis, Mo.

GRANT Mfg. & Machine Co., 90 Selliman Ave., Bridgeport, Conn.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. (See page 383.)

HAWTHORNE Mfg. Co., 38 Spruce St., Bridgeport, Conn. (See page 307.)

HILES & Co., C. A., 14th St. & Western Ave., Chicago, Ill.

HOUPERT Machine Co., 349 W. 52d St., New York, N. Y. (See page 847.)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

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MACHINE WORK (Continued)

SPECIAL MACHINE WORK TO ORDER (Continued)

INDIANAPOLIS Tool & Mfg. Co., 520 S. Capitol Ave., Indianapolis, Ind.

INDUSTRIAL Electric Mfg. Co., 189 Beaubien St., Detroit, Mich.

JACOBSON Machine Mfg. Co., Warren, Pa.
(See page 851.)

JOHNSON Bronze Co., New Castle, Pa.

JOHNSTON & Jennings Co., 377 Addison Rd., Cleveland, O.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

KERMATH Mfg. Co., 45 Fort St. E., Detroit, Mich.

KIDDER-OSWALD Co., Dayton, O.

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

KRAHN Mfg. Co., 588 Clinton St., Milwaukee, Wis.

LACLEDE Iron Works, 1315 Chestnut St., St. Louis, Mo.

LADISH-OBENBERGER Co., Cudahy, Wis.
(See page 799.)

LAWRENCE & Co., L., 292 Halsey St., Newark, N. J.
(See page 799.)

LEE Co., Wm. O., Port Huron, Mich.

LEWIS Spring & Axle Co., 42 Hollier St., Chelsea, Mich.

LIGGETT Spring & Axle Co., Monongahela, Pa.

LIMERICK Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

LINK-BELT Co., 732 Dime Bank Bldg., Detroit, Mich.
(See page 155.)

LONG Machine Works, Adam A., Ave. E & St. Paul St., Rochester, N. Y.

LYCOMING Foundry & Machine Co., Williamsport, Pa.
(See page 715.)

McDOUGALL & Potter Co., 606 W. 55th St., New York, N. Y.

MASSNICK-PHIPPS Mfg. Co., 1091 Lafayette Ave., E., Detroit, Mich.

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass.
(See page 249.)

METROPOLITAN Mfg. Co., Detroit, Mich.
(See page 479.)

MODERN Machinery Co., Monroe & Fifth Sts., Wilmington, Del.

MORGAN Mfg. Co., John St., Newport, R. I.

MURRAY Machine Works, 1924 Wabansia Ave., Chicago, Ill.

NATIONAL Engineering Co., Saginaw, Mich.
(See page 827.)

NATIONAL Sewing Machine Co., Belvidere, Ill.

NATIONAL Stamping & Electric Works, 410-26 Clinton St., Chicago, Ill.

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn.
(See page 753.)

NILSON-MILLER Co., 13th & Hudson Sts., Hoboken, N. J.

OBERDORFER Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

PARKER White Metal & Machine Co., Railroad St., Erie, Pa.
(See page 149.)

PARTS Mfg. Co., 217 E. Eighth St., Cincinnati, O.

PETERS Machine & Mfg. Co., Madison Ave. & W. 74th St., Cleveland, O.

PIPER Machine Co., 560-70 N. Elder Ave., Indianapolis, Ind.

PORTLAND Forge & Foundry Co., Portland, Ind.

PROSSER Engineering Co., 2106 W. Superior Ave., Cleveland, O.

PROVIDENCE Engineering Works, 521 S. Main St., Providence, R. I.

PURITAN Machine Co., 409-21 Lafayette Blvd., Detroit, Mich.

RELIANCE Engineering Co., Lansing, Mich.

REUS Bros. Co., 146 W. Mt. Royal Ave., Baltimore, Md.

ROSS Machine Co., 208 S. Fourth St., La Fayette, Ind.

RUSSEL Wheel & Foundry Co., Chene St. & Belt Line R. R., Detroit, Mich.

S. A. Machine Co., Detroit, Mich.
(See page 749.)

"S-C" Regulator Co., Fostoria, O.

SAYRE Stamping Co., Sayre, Pa.

SCALLAN & Co., W. E., 1123-25 Gest St., Cincinnati, O.

SCHATZ Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill.
(See page 255.)

SELIK Bros., 640-48 24th St., Detroit, Mich.

SERVICE Gear & Machine Co., Reading, Pa.
(See page 817.)

SHIMER & Sons, Samuel J., Milton, Pa.

SIER-BATH Co., 143 W. 54th St., New York, N. Y.
(See page 825.)

SLOAN & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.

SMITH Mfg. Co., Philip, Sidney, O.

SOUTH Park Mfg. Co., Port Huron, Mich.

SPACKE Machine Co., F. W., Indianapolis, Ind.
(See page 325.)

STANDARD Mfg. Co., 990 Housatonic Ave., Bridgeport, Conn.

SUPERIOR Machine & Engineering Co., 51-53 Fort St., E., Detroit, Mich.

T. C. M. Mfg. Co., Hunterdon & First Sts., Harrison, N. J.

TAFT-PEIRCE Mfg. Co., Woonsocket, R. I.

TORRINGTON Mfg. Co., Torrington, Conn.

TURNER & Moore Mfg. Co., 32 Addison Ave., Detroit, Mich.

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ACCURATELY MADE

PROMPT DELIVERIES

PISTONS
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TRANSMISSION GEARS
CYLINDERS

CONSISTENT PRICES

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SPACKE Automobile Machine Parts, made to specifications, are the result of years of effort devoted to this work, and to the furnishing in quantity of better and cheaper parts.

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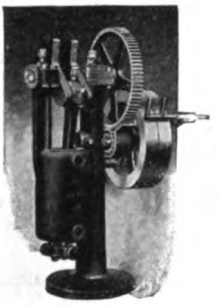

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No modern garage is complete without this equipment. *Send for catalog and prices.*

THE F.W. SPACKE MACHINE CO

INDIANAPOLIS, IND., U.S.A.

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SPECIAL MACHINE WORK TO ORDER (Continued)

UNION Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.

VOELKNER & Harry Mfg. Co., 282-92 Woodbridge St., E. Detroit, Mich.

VULCAN Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.

WADE Machine Co., 817 Albany St., Boston, Mass.

WARE Bros., 224 N. Ada St., Chicago, Ill. (See page 339.)

WARNER Bros. Machine Works, High & Howard Sts., Muncie, Ind.

WEBER Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill. (See page 793.)

WEISS, L. T., 293 Taaffe Pl., Brooklyn, N. Y

WEST & Dodge, 884 Atlantic Ave., Boston, Mass.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

WILCOX-McKIM Co., Saginaw, Mich.

ZEIFANG Machine Co., 825 Linwood Ave., Niagara Falls, N. Y.

MAGNETOS

IGNITION MAGNETOS AND DYNAMOS

BERKSHIRE Magneto Co., Fourth St., Pittsfield, Mass.

BERLING—See Ericsson Mfg. Co.

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

BRIGGS Magneto Co., Elkhart, Ind.

C. A. S. Sales Co., 799-80- Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

DIXIE—See Splitdorf Electrical Co.

DOW Mfg. Co., 131 Adams St., Braintree, Mass.

EISEMANN Magneto Co., 32-33d St., Brooklyn, N. Y. (See page 327.)

ERICSSON Mfg. Co., 1126 Military Rd., Buffalo, N. Y. "Berling." (See page 365.)

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco." (See page 675.)

HERZ & Co., 245 W. 55th St., New York, N. Y. (Importers.) (See page 389.)

K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See pages 654 and 655.)

KINGSTON—See Kokomo Electric Co.

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

MARBURG Bros., 1790 Broadway, New York, N. Y. (Importers.) "Mea." (See page 329.)

MEA—See Marburg Bros.

MENOMINEE Electric Mfg. Co., Menominee, Mich.

NATIONAL Coil Co., Lansing, Mich.

REMY Electric Co., Anderson, Ind. (See page 733.)

SEVISON Electric Co., McDonald & Richmond Sts., Elkhart, Ind.

SIMMS Magneto Co., East Orange, N. J. (See page 627.)

SIMPLEX Magneto Co., 1790 Broadway, New York, N. Y. (See pages 300 and 301.)

SPLITDORF Electrical Co., Newark, N. J. "Dixie."

SWISS Magneto Co., 208 S. La Salle St., Chicago, Ill.

U. H. Magneto Co., 2 Columbus Circle, New York, N. Y. (Importers.)

MAGNETS

PERMANENT MAGNETS

(For Magnetos)

ESTERLINE Co., 228 E. South St., Indianapolis, Ind.

LINDENBERG Steel Co., 90 West St., New York, N. Y. (Importers.)

SHUNK Plow Co., Bucyrus, O.

MANIFOLDS

INTAKE AND EXHAUST MANIFOLDS

(Brazed and Welded Manifolds. For Cast Manifolds—See Castings)

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

AMERICAN Tube Products Co., Euclid Ave., E., & Grand Trunk Ry., Detroit, Mich.

DIAMOND Mfg. Co., Detroit, Mich.

ELYRIA Iron & Steel Co., E. 131st St., Cleveland, O. (See page 543.)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

JACOBS Co., F. L., 449-53 Guoin St., Detroit, Mich. (See page 329.)

MILLER Metalwork Co., 411 St. Paul's Ave., Jersey City, N. J. (See page 751.)

NATIONAL Pipe Bending Co., River & Lloyd Sts., New Haven, Conn.

NEW JERSEY Tube Co., Newark, N. J.

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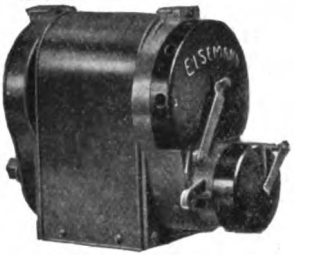
PERFECT IGNITION!

The Automatic Spark Control Magneto,

(an exclusive Eisemann feature) is now made in the waterproof type GA for 4 cyl. motors for both single and dual ignition.

Type G—4-cyl.
(Waterproof)
Single Ignition.
Used by Pierce-Arrow, Kelly-Springfield, Dodge Bros., Federal and 51 other manufacturers.

G N—6-cyl.
(Waterproof)
Single Ignition
Used by Lozier, National, Kissel and 6 other manufacturers.



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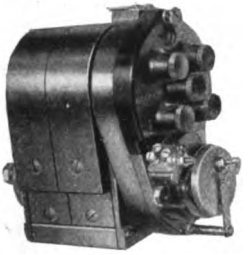
Besides these models,

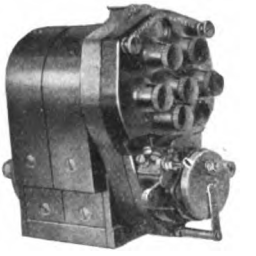
We Make Other Models

to cover every requirement of gas or gasoline engines.



E M R—4-cyl.
(Waterproof)
Dual Ignition.
Used by Pierce-Arrow, Service Trucks and 3 other manufacturers.

E M R—6-cyl.
Dual Ignition.
Used by Locomobile, Crane, Simplex and 4 other manufacturers.



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415-417 N. Capitol Ave.

Detroit, Mich.
802 Woodward Ave.

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MANIFOLDS (Continued)

INTAKE AND EXHAUST MANIFOLDS (Continued)

ROBERTS Brass Co., 249 Lake St., Milwaukee, Wis.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

STANDARD Metal Mfg. Co., Newark, N. J. (See page 277.)

STANDARD Metalwork Co., 22-40 Prospect St., Thompsonville, Conn.

STANDARD Tool & Mfg. Co., 68-72 E. Lafayette Ave., Detroit, Mich.

STANDARD Welding Co., Cleveland, O. (See Book Mark.)

UNITED Wire & Supply Co., 109 Summer St., Providence, R. I.

WEBER Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill. (See page 793.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WILMO Co., 708 Fulton St., Chicago, Ill.

MANUFACTURERS AGENTS

(This is a list of Manufacturers Agents who advertise in this publication.)

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (See pages 300 and 301.)

DENTON & Anderson, Engineers Bldg., Cleveland, O. (See page 545.)

FAW, J. H., 41 Warren St., New York, N. Y. (See page 845.)

REINHARD Bros. Co., Minneapolis, Minn. (See page 817.)

MAPS

ROAD MAPS

AUTOMOBILE Blue Book Publishing Co., 243 W. 39th St., New York, N. Y. (See pages 372A, 372B, 372C and 372D.)

CHADWICK, L. S., 7309-609 Platt Ave., Cleveland, O.

CLASON Map Co., 1515 Tremont Pl., Denver, Colo.

DOVER Route Indicator Co., Occoquan, Va.

HUEBINGERS—See Iowa Publishing Co.

IOWA Publishing Co., Fifth St. & Grand Ave., Des Moines, Ia. "Huebingers."

KING, Sidney J., 626-36 S. Clark St., Chicago, Ill.

MENDENHALL, C. S., Race St., & Opera Pl., Cincinnati, O.

SCARBOROUGH Co., 333 N. Delaware Ave., Indianapolis, Ind.

WALKER Lithograph & Publishing Co., 400 Newbury St., Boston, Mass.

MATS

COCOA MATS

DARRAGH, Small & Co., 177 Water St., New York, N. Y.

HEYWOOD Bros. & Wakefield Co., 174 Portland St., Boston, Mass. "Slide-On," "Holdfast."

HOLDFAST—See Heywood Bros. & Wakefield Co.

KEMPF & Son, Wm. F., 1027-33 N. Fourth St., Philadelphia, Pa.

McCABE & Bro., Benj., 37 E. 13th St., New York, N. Y.

RANCOCAS Mills, Trenton, N. J.

SLIDE-ON—See Heywood Bros. & Wakefield Co.

RUBBER MATS

ACME Rubber Mfg. Co., Trenton, N. J.

BOSTON Belting Co., 84 Linden Park St., Boston, Mass.

BOSTON Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass. "Lenox," "Tiger."

BOWERS Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

CINCINNATI Rubber Mfg. Co., Cincinnati, O. (See page 763.)

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ESSEX Rubber Co., Trenton, N. J.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

GOODRICH Co., B. F., Akron, O.

HAMILTON Rubber Mfg. Co., Trenton, N. J. (See page 505.)

HOME Tire Co., Trenton, N. J.

LENOX—See Boston Woven Hose & Rubber Co.

MANHATTAN Rubber Mfg Co., Passaic, N. J

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill.

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

MILFORD Rubber Works, Milford, Ill.

MINERALIZED Rubber Co., 165 Chambers St., New York, N. Y.

MONARCH Rubber & Oil Cloth Co., Drexel Bldg., Philadelphia, Pa.

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

NEW York Belting & Packing Co., 91 Chambers St., New York, N. Y.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

QUAKER City Rubber Co., Philadelphia, Pa. (See page 839.)

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

TIGER—See Boston Woven Hose & Rubber Co.

VICTOR Rubber Co., Springfield, O. (See page 529.)

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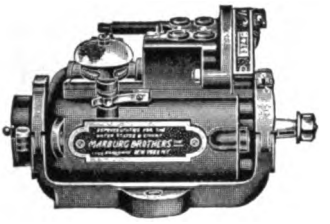

MEA Magneto Sole Importers **SRO Ball Bearing**

MARBURG BROS., Inc., 1790 Broadway, New York

DETROIT TORONTO CHICAGO

PYRMA

ALUMINUM MATTING

STRONGEST IN SERVICE AND LOWEST IN COST

Stock sizes for 50 ft. rolls are 9, 10, 12, 14, 15, 18 and 20 inch widths; for 24 ft. rolls 24, 30 and 36 inch widths. Of course special lengths and widths can always be supplied.

ALUMINUM MOULDING

J-shape running board moulding in 10 to 14 ft. lengths in stock for immediate delivery.

ALUMINUM HEEL PLATE

Made of special extra heavy aluminum that lasts longer than the car.

Write for samples of matting and moulding.

Manufacturers—Get our attractive prices on quantity lots of matting, moulding or heel plates—all made of aluminum.

Dealers and Jobbers—Good profits are yours—if you push these articles.

WRITE—TODAY—FOR SAMPLES.

METALLIC AUTOMOBILE MATTING COMPANY

Rochester New York

BRAKE RODS

Complete Brake Rod Assemblies made to Blue Prints

Steel Manifolds

Gas Intake, Water and Exhaust Manifolds of Seamless Welded or Brazed Tubing.

F. L. Jacobs Co.

449-453 Guoin Street, Detroit, Mich.

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MATS (Continued)

RUBBER MATS (Continued)

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

STEEL MATS

WORTH Wire Works, Kokomo, Ind.

STEP OR RUNNING BOARD MATS

BANTAM Mfg. Co., 64 Pearl St., Boston, Mass.

LA PORTE Mat & Mfg. Co., La Porte, Ind.

MOSLER & Co., A. R., Mt. Vernon, N. Y.

STANWOOD Equipment Co., 50 Congress St., Boston, Mass.

MATTING

ALUMINUM MATTING

ALUMINUM Co. of America, Pittsburg, Pa. (See page 479.)

METALLIC Automobile Matting Co., Rochester, N. Y. "Pyrma." (See page 329.)

PYRMA—See Metallic Automobile Matting Co

METALS

BEARING METALS

A. B. C. Castings Co., 6515 Carnegie Ave., S. E., Cleveland, O. "Meteor."

ACORN—See Cadman Mfg. Co.

ADAMANT—See Magnolia Metal Co.

ÆTNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ALBANI—See Cox Brass Mfg. Co.

ALUMINUM Castings Co., 6217 Carnegie Ave., Cleveland, O. "Lynux." (See page 139.)

AMERICAN Bronze Co., Berwyn, Pa. "Non-Gran." (See page opp. Inside Front Cover.)

AMERICAN Bronze Co., 90-108 Arthur St., Buffalo, N. Y. "Grainless."

AMERICAN Manganese Bronze Co., (Holmesburg), Philadelphia, Pa. "Spare's."

AMERICAN Metal Products Co., Ampco Bldg., Milwaukee, Wis. "Ampco."

AMPCO—See American Metal Products Co.

ANDERSON Foundry Co., Wm. B., 24-30 S. Clinton St., Chicago, Ill.

AUTO-CRAT—See Syracuse Smelting Works.

AZALEA—See Vanadium Metals Co.

BEAR—See Shonberg, I.

BESLY & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill. "Helmet."

BIRKENSTEIN & Sons, S., 397 W. Ontario St., Chicago, Ill. (See page 791.)

BLAKE, Edwin J., 565 Windsor St., Hartford, Conn.

BLATCHFORD Co., E. W., 230 N. Clinton St., Chicago, Ill.

BRIDGEPORT—See Monumental Bronze Co.

BUNTING Brass & Bronze Co., 737 Spencer St., Toledo, O. (See page 335.)

CADMAN Mfg. Co., A. W., 2814-16 Smallman St., Pittsburg, Pa. "Acorn."

CARSON-ROWELL Co., Union & Hancock Sts., Appleton, Wis.

CHAMET—See Chase Rolling Mill Co.

CHASE Rolling Mill Co., Waterbury, Conn. "Chamet."

CLIMAX—See North American Smelting Co.

CLOVER LEAF—See Williams & Son.

COLORADO Lead Works Co., 1516 Blake St., Denver, Colo.

COLUMBIA Smelting & Refining Works, 365-67 West St., New York, N. Y.

COLUMBIAN Brass Foundry, Freeport, N. Y. "Excello."

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Albani." (See page 717.)

CRAMP & Sons Ship & Engine Building Co., William, Philadelphia, Pa. "Parsons." (See page 335.)

DAMASCUS Bronze Co., Pittsburg, Pa.

DANN Products Co., 2290 Indiana Ave., Chicago, Ill. "Dannite." (See page 837.)

DANNITE—See Dann Products Co.

DAYTON Bronze Bearing Co., 916-18 E. Third St., Dayton, O.

DELAWARE Brass & Aluminum Co., Muncie, Ind. (See page 147.)

DUTCH BOY—See National Lead Co.

EDNA Brass Mfg. Co., 525-33 Reading Rd Cincinnati, O.

ELECTRIC Smelting & Aluminum Co., Lockport, N. Y.

ELEPHANT—See Phosphor Bronze Smelting Co.

EMPIRE Metal Co., 820 E. Water St., Syracuse, N. Y. "Premier," "Triumph."

EUREKA Brass Co., 2210-18 Scott Ave., St. Louis, Mo

EUREKA Co., North East, Pa. (See page 333.)

EXCELLO—See Columbian Brass Foundry.

FAHRIG Metal Co., 34 Commerce St., New York, N. Y. (See page 703.)

FEDERAL Brass Works, 362-74 Trombley Ave., Detroit, Mich.

FRICTIONLESS Metal Co., Chattanooga, Tenn.

GARDINER Metal Co., 1356-64 W. Lake St., Chicago, Ill.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GENERAL Aluminum & Brass Mfg. Co., Detroit, Mich. (See page 333.)

GERMANN Bronze Co., 355 W. 19th St., Erie, Pa.

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143 SIZES

BUSHINGS

Cast in the Rough

Carried in STOCK

ELEPHANT BRAND

DELTA

REG. U.S. PAT. OFF.

THE PHOSPHOR BRONZE SMELTING CO.

2200 WASHINGTON AVENUE, PHILADELPHIA, PA.

ELEPHANT BRAND Phosphor-Bronze

INGOTS, CASTINGS, WIRE, SHEETS, RODS, Etc.

—DELTA METAL—

IN BARS FOR FORGING AND FINISHED RODS

ORIGINAL AND SOLE MAKERS IN THE U. S.

ELEPHANT BRAND

DELTA

REG. U.S. PAT. OFF.

ALSO,

near size finished drawn

TUBING

for

BEARINGS

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METALS (Continued)

BEARING METALS (Continued)

GRAHAM & Co., James, 293 Wooster St., New Haven, Conn.

GRAINLESS—See American Bronze Co.

GREAT Western Smelting & Refining Co., 41st & Wallace Sts., Chicago, Ill.

HARPER, Thomas, 204 Lafayette St., New York, N. Y. "Hi-Servis."

HECLA—See Paulson & Son.

HELMET—See Besly & Co.

HENNING & Sons, V., 314-36 Belmont Ave., Brooklyn, N. Y.

HI-SERVIS—See Harper, Thomas.

HOWARD Metal Co., Second & Canal Sts., Reading, Pa.

HOYT Metal Co., 300 N. Broadway, St. Louis, Mo. "Trojan."
(See page 145.)

KAHN Bros., 775-97 Humboldt St., Brooklyn, N. Y.

LEHMAN Bros., 401-05 Jefferson St., Hoboken, N. J.

LIGHT Mfg. & Foundry Co., Pottstown, Pa.
(See page 403.)

LISSBERGER & Son, Marks, 281 Borden Ave., Long Island City, N. Y.

LUMEN Bearing Co., Buffalo, N. Y.
(See page opposite Last Page.)

LYNUX—See Aluminum Castings Co.

McGILL Metal Co., Valparaiso, Ind.

MAGNOLIA Metal Co., 113-15 Bank St., New York, N. Y. "Adamant."

MERCHANT & Evans Co., Philadelphia, Pa. "S. A. E."
(See page 405.)

METEOR—See A. B. C. Castings Co.

MODERN Die & Tool Co., Indianapolis, Ind. "Victor."
(See page 725.)

MOGUL Metal Co., Detroit, Mich.
(See page 147.)

MONUMENTAL Bronze Co., 354 Howard St., Bridgeport, Conn. "Bridgeport."

MORE-JONES Brass & Metal Co., 3133-44 N. Broadway, St. Louis, Mo.

MUZZY-LYON Co., 149-63 Larned St., W., Detroit, Mich.
(See page 147.)

NATIONAL Lead Co., New York, N. Y. "Dutch Boy."
(See page 153.)

NON-GRAN—See American Bronze Co.

NORTH American Smelting Co., 900 W. Thompson St., Philadelphia, Pa. "Vulcan," "Philadelphia," "Climax."

PARSONS—See Cramp & Sons.

PAULSON & Son, Thomas, 97 Second Ave., Brooklyn, N. Y. "Hecla."
(See page 731.)

PHILADELPHIA — See North American Smelting Co.

PHOSPHOR Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. "Elephant."
(See page 331.)

PITTSBURGH White Metal Co., 3116 Penn Ave., Pittsburgh, Pa.

PREMIER—See Empire Metal Co.

REEVES & Co., Paul S., 1415-25 Catharine St., Philadelphia, Pa.

REVOLUTION—See Sanford Co.

RICHARDS & Co., 200-06 Causeway St., Boston, Mass.

S. A. E.—See Merchant & Evans Co.

SANFORD Co., David C., 33-39 Drouve St., Bridgeport, Conn. "Revolution."

SEMPER IDEM—See Wildes Son.

SHONBERG, I., 122 Flushing Ave., Brooklyn, N. Y. "Bear."

SPARE'S—See American Manganese Bronze Co.

STANLEY—See Syracuse Smelting Works.

SYRACUSE Smelting Works, 153 Jewell St., Brooklyn, N. Y. "Auto-Crat," "Stanley."

THIERY & Kendrick Mfg. Co., Detroit, Mich.
(See page 797.)

TITAN Metal Co., Bellefonte, Pa.

TRIUMPH—See Empire Metal Co.

TROJAN—See Hoyt Metal Co.

U S A—See United Smelting & Aluminum Co.

UNITED Smelting & Aluminum Co., 183-89 Commerce St., New Haven, Conn. "U S A."

VAN WAGNER Mfg. Co., E. B., Syracuse, N. Y.
(See page 141.)

VANADIUM—See Enterprise Metal Co.

VANADIUM Metals Co., Vanadium Bldg., Pittsburgh, Pa. "Azalea."

VICTOR—See Modern Die & Tool Co.

VULCAN—See North American Smelting Co

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

WILDES Son, Thomas, 14 Dover St., New York, N. Y. "Semper Idem."

WILLIAMS & Son, E. A., 105-11 Plymouth St., Jersey City, N. J. "Clover Leaf."

WING & Co., J. T., 15-19 Woodward Ave., Detroit, Mich.

ZENITE Metal Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

PERFORATED METALS

BECKLEY Perforating Co., C. R. R. R. Ave., Garwood, N. J.

CHICAGO Perforating Co., 2445 W. 24th Pl., Chicago, Ill.

CLINTON Wire Cloth Co., Clinton, Mass.

ERDLE Perforating Co., 7 Factory St., Rochester, N. Y.

HARRINGTON & King Perforating Co., 632 N. Union St., Chicago, Ill.

HENDRICK Mfg. Co., Carbondale, Pa.

MANHATTAN Perforated Metal Co., 237-39 Centre St., New York, N. Y.

MUNDT & Sons, Chas., 53-57 Fairmount Ave., Jersey City, N. J.

NORTMANN-DUFFKE Foundry Co., 27th Ave. & N. W. R. R., Milwaukee, Wis.

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SOLID AND CORED BARS

Copper and
Bronze
Forgings

Bronze Washers
Soldering
Coppers

Brass and
Bronze
Castings

Bronze Bushings
Copper
Hammers

ELECTRICAL COMMUTATORS

Phosphor-bronze and copper gauze brushes
Hard rolled copper leaf brushes

THE EUREKA CO., North East, Penna.

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METERS

COMPRESSION METERS

(See Gages, Cylinder Compression)

DISTANCE RECORDING METERS OR ODOMETERS

(For combined Odometers and Speedometers—See Speedometers)

BAUMGAERTNER, F., 2844 E. 105th St., Cleveland, O. "Coronet."

CORONET—See Baumgaertner, F.

CORONET Mfg. Co., 168 Church St., New York, N. Y.

JONES Speedometer Co., Bush Terminal, Brooklyn, N. Y.

TRANSIMETER Co., 735 Seventh Ave., New York, N. Y.

VEEDER Mfg. Co., 22 Sargeant St., Hartford, Conn.

GRADE METERS

ADAMS Co., Dubuque, Ia. "Gradometer."

AMERICAN Thermo Ware Co., 16 Warren St., New York, N. Y. (Importers.) "Autocrat."

AUTOCRAT—See American Thermo Ware Co.

E. G.—See Grossman Mfg. Co.

GRADOMETER—See Adams Co.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N Y. "E. G." (See page 829.)

WEINHAGEN, H., 159-65 Leonard St., New York, N. Y.

HEAT INDICATING METERS

(For attachment to radiator to show temperature of cooling water)

BOYCE MOTOMETER—See Motometer Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

FOWLER Motor Thermometer Co., Pierce Bldg., St. Louis, Mo.

FOXBORO Co., Foxboro, Mass.

MOTOMETER Co., 15 Wilbur Ave., Long Island City, N. Y. "Boyce Motometer." (See page 809.)

MOTOR-EYE—See Robinson Mfg. Co.

ROBINSON Mfg. Co., J. E., 504 W. Van Buren St., Chicago, Ill. "Motor-Eye."

SPEED METERS

(See Speedometers)

TAXI METERS

(See Taximeters)

MICA

AMERICAN Mica Co., Newton Lower Falls, Mass.

ASHEVILLE Mica Co., Asheville, N. C.

CHICAGO Mica Co., Valparaiso, Ind.

DIELECTRIC Mfg. Co., 224 S. Vandeventer Ave., St. Louis, Mo.

GRANITE State Mica Co., Old South Bldg., Boston, Mass.

HILL Insulating & Mfg. Corp., 511-13 W. 42d St., New York, N. Y. (See page 393.)

MICA Mfg. Co., 150-52 Chambers St., New York, N. Y.

MUNSELL & Co., Eugene, 68 Church St., New York, N. Y.

NEW York Mica & Mfg. Co., Clark & Green Sts., Auburn, N. Y.

PRESTON Co., Robert K., Monadnock Bldg., Chicago, Ill. "Prestonite."

RAYO Auto Supply Co., 225 Bridge St., Brooklyn, N. Y. (See page 815.)

PRESTONITE—See Preston Co.

SCHOONMAKER Co., A. O., 88 Park Pl., New York, N. Y.

SNOW FLAKE—See Western Mica Mining & Milling Co.

TAR Heel Mica Co., Plumtree, N. C.

UNITED Mica Co., Grafton Center, N. H.

WATSON Bros., 170 Purchase St., Boston Mass.

WESTERN Mica Mining & Milling Co., W. 16th Ave. & Bryant St., Denver, Colo. "Snow Flake."

MIRRORS

ADJUSTABLE DASHBOARD MIRRORS

(To enable driver to see to the rear of the car)

ALEXANDER Mfg. Co., J., 1931 Broadway, New York, N. Y. "Mirrorscope."

ARGOS—See Motor Car Equipment Co.

AUTO Specialty Co., 416-18 N. Sycamore St., Santa Ana, Cal.

BELLAMY—See Novelty Mfg. Co.

E. G.—See Grossman Mfg. Co.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E G." (See page 829.)

HIND VIEW—See Kales-Haskel Co.

HOCO—See Hoeft & Co.

HOEFT & Co., Ashland Ave. & Kinzie St., Chicago, Ill. "Hoco."

KALES-HASKEL Co., 441-53 Lafayette Blvd., Detroit, Mich. "Hind View."

LAMB Mfg. Co., Winsted, Conn.

MIRRORSCOPE—See Alexander Mfg. Co.

MOTOR Car Equipment Co., 21 W. 62d St., New York, N. Y. (Importers.) "Argos." (See page 809.)

NOVELTY Mfg. Co., 125 Maple St., Waterbury, Conn. "Bellamy."

RILEY-KLOTZ Mfg. Co., 17 Mulberry St., Newark, N. J.

STARR Bros., East Hampton, Conn.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

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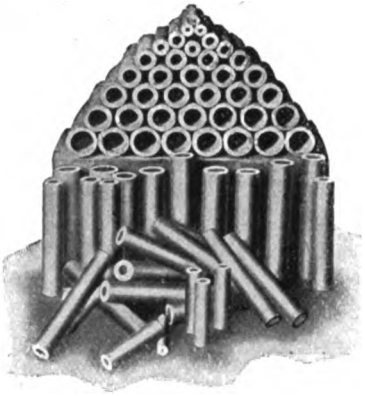
CRAMP

CORED BARS FOR BUSHINGS

Furnished either in PARSONS' WHITE BRASS or CRAMP'S SPECIAL BEARING BRONZE. Sizes of bars not shown in the list and cored whole and half bushings with end collars can be furnished from stock patterns. In ordering refer to the number in first column.

PARSONS' WHITE BRASS for main engine and crank pin bearings.

CRAMP'S SPECIAL BEARING BRONZE for wrist pin, cam-shaft, transmission bearings, valve stem guides and similar bearings.



List of cored and solid cast bars of our bearing metals in stock:

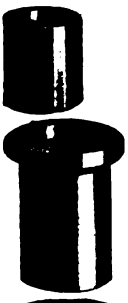
	Outside Diameter. Inches.	Inside Diameter. Inches.	Length. Inches.
1.....	1	½	6
2.....	1½	½	6
3.....	1½	¾	12
4.....	1¾	¾	12
5.....	1¾	1	12
6.....	2	1	12
7.....	2	1¼	12
8.....	2¼	1	12
9.....	2¼	1¼	12
10.....	2½	1¼	12
11.....	2½	1½	12
12.....	2¾	1½	12
13.....	2¾	1¾	12
14.....	3	2	12
15.....	3	2¼	12
16.....	3¾	2¼	12
17.....	3¼	2½	12

Solid bars up to 2 inches diameter.

THE WILLIAM CRAMP & SONS SHIP AND ENGINE BUILDING CO.
PHILADELPHIA, PA.

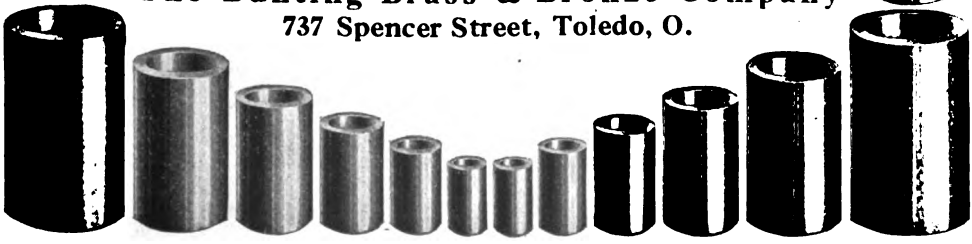
BUNTING

Patented Bronze Bushings and Bearings



Their quality has made them favorably known to more than four hundred manufacturers of machine tools, automobiles and automobile parts, etc. Bunting's Patented Bronze Bushings and Bearings come to you complete, ready for use, of tested and guaranteed value.

The Bunting Brass & Bronze Company
737 Spencer Street, Toledo, O.



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MIRRORS (Continued)

ADJUSTABLE DASHBOARD MIRRORS (Continued)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

WATER GAGE MIRRORS

KNOX Co., Frank J., Hartford, Conn.

MIXERS

FUEL MIXERS, ECONOMIZERS OR AGITATORS

AER-IN—See Ware Bros.

AEROFRAM Co., 107 Massachusetts Ave., Boston, Mass.
(See page 627.)

AMERICAN Automobile Specialty Co., 510 S. Ashland Blvd., Chicago, Ill. "Vigor."

AUTOMATIC Carburetor Co., 2021 Michigan Ave., Chicago, Ill.
(See page 341.)

AUTOMATIC Carburetor Regulator Co., Union Trust Bldg., Detroit, Mich.

BAILEY Co., Wm. J., 401-07 Mulberry St., Newark, N. J. "C. B."

BEITMAN & Co., I. B., Security Bldg., Chicago, Ill.

BINGHAM Mfg. Co., West Park, O. "G. L."

BROWN-TAYLOR-GREENE Co., 1323-25 S. Michigan Ave., Chicago, Ill. "Empire."

BRUGAN Co., Bangor, Me.
(See page 361.)

BURGESS Specialty Co., 98 Pond St., Providence, R. I. "Little Wonder."
(See page 527.)

C. B.—See Bailey Co.

CARBOGAS Co., Gardner Bldg., Toledo, O.

CHAMPION, F. M., 236 Elizabeth St., Utica, N. Y.

CLEMMER, G. H., West Alexandria, O.

CRONE, F. G., 334 Genesee St., Buffalo, N. Y.

DEPPE, W. P., 127 Duane St., New York, N. Y. "Stanley."

DUPLEX Vitalizer Mfg. Corp., Elmira, N. Y.
(See page 649.)

ECONOMY Gas Vaporizer Co., 6 E. Maumee St., Adrian, Mich.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill. "Jumbo."

EVAPCO Mfg. Co., 429 Grand River Ave., Detroit, Mich.
(See pages 337 and 338.)

G. L.—See Bingham Mfg. Co.

GAS Motor Efficiency Co., Janesville, Wis.

GASCO—See Gasket Supply Co.

GASKET Supply Co., 1729 Ludlow St., Philadelphia, Pa. "Gasco."
(See pages 765 and 795.)

GASSAVE—See Leathers Bros. Co.

"GO" Motor Speeder Co., 165 Third Ave., Three Rivers, Mich.
(See page 847.)

HERZ & Co., 245 W. 55th St., New York, N. Y. "Phoenix."
(See page 389.)

HINE-WATT Mfg. Co., 130 N. Market St., Chicago, Ill. "Sly."

HUBBARD, R. L., 4 Gouverneur St., Newark, N. J.

IECO—See Interstate Electric Co.

INDIANAPOLIS Mfg. & Sales Co., 2305 N. Delaware St., Indianapolis, Ind.

INTERSTATE Electric Co., Baronne & Perdido Sts., New Orleans, La. "Ieco."

JENKINS Vector Co., Richmond, Va.

JEWELL Auto Devices Co., Frankfort, Ind.

JOSWICH Mfg. Co., F., 382-84 Cedar St., St. Paul, Minn.

JUMBO—See Edelmann & Co.

KERO-MIX—See Patterson, F. W.

KERNODLE-M'DANIEL Co., Frankfort, Ind.

LANG—See Vapor Gasket Co.

LEATHERS Bros. Co., Howard, Pa. "Gassave."

LIPMAN Mfg. Co., 211 Pleasant St., Beloit, Wis.

LITTLE WONDER—See Burgess Specialty Co.

LYNDON Mfg. Co., 116 S. Michigan Ave., Chicago, Ill.. "Speedler."

M & M Sales Co., Lewistown, Pa.

MARTIN Shock Absorber Corp., 1301-1401 E. Slauson Ave., Los Angeles, Cal.

MICHENER, E. S., 30 Washington St., New Castle, Pa.

MORSE Gasoline Economizer Co., Barrington, R. I.

OXYGEN Valve Co., 69 Genesee St., Utica, N. Y.

OXYGENERATOR Co., 1919 Michigan Ave., Chicago, Ill.
(See pages 302 and 303.)

PAR-KOP Mfg. Co., 1522 Ingersoll St., Philadelphia, Pa. "Parker."

PARKER—See Par-Kop Mfg. Co.

PARKER-NOONAN Auxiliary Air Valve Co., Mercantile Library Bldg., Cincinnati, O.

PATTERSON, F. W., 336 E. 43d St., Chicago Ill. "Kero-mix."

PECK, E. C., 432 Third St., San Bernardino, Cal.

PEERLESS Motor Specialty Co., 146 W. 52d St., New York, N. Y.

PERKINS Appliance Co., 539 Worthington St., Springfield, Mass.
(See page 709.)

PERPETUAL—See Ratliff, Sidney A.

PHOENIX—See Herz & Co.

PROGRESSIVE Mfg. Co., 468 64th Ave (W. Allis), Milwaukee, Wis.

RATLIFF, Sidney A., Main St., Riverside, Cal. "Perpetual."

REFLEX Ignition Co., 1710 Payne Ave., Cleveland, O.
(See page 675.)

RIGHT Motor Specialties Co., 1322 Michigan Ave., Chicago, Ill.

ROYAL-SILENT Motor Co., Los Angeles, Cal.

RUSSELL Electric Co., Danbury, Conn.

SAUNDERS Co., Leslie R., 1250-60 W. Seventh St., Los Angeles, Cal.

SEVISON Electric Co., McDonald & Richmond Sts., Elkhart, Ind.

SLY—See Hine-Watt Mfg. Co.

SPEEDLER—See Lydon Mfg. Co.

Complete Index to Classification appears on Pages 8 to 27.

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The EVAPCO Gas Saver

The First Mechanically Correct Gas Saver

READ THESE FACTS

The Evapco Gas Saver was perfected by one of the foremost automobile engineers in this country, Mr. E. M. White. His name alone places this gas saver in a class by itself.

The Evapco Gas Saver is constructed on scientific principles and has been tried out under the most trying conditions. It remains firmly closed when the motor is starting, thus giving the rich mixture necessary for easy starting. At the higher speeds it opens gradually, giving an increased volume of air in relation to the speed, thus providing the ideal mixture at all times.

The Evapco Gas Saver shuts off completely when the motor begins to pull hard up a hill or through sand or mud, thus giving the rich mixture necessary for utmost power.

The Evapco Gas Saver requires no adjustment whatever being made to the carburetor, thus eliminating all trouble.

The Evapco Gas Saver fits any size or style of motor. The dealer need carry only one size and style in stock.

35%—50% GAS SAVING

The Evapco Gas Saver in comparative tests shows the very highest saving in gasoline—35 to 50 per cent is a fair average.

The Evapco Gas Saver is absolutely guaranteed and if it fails to show satisfactory results the purchaser can get the full purchase price back at any time within thirty days.

Extremely simple. All metal. Will last the life of the car. Installed in fifteen minutes' time. Simply tap a hole in the manifold and screw it in.

This is undoubtedly the most remarkable selling proposition that has ever been offered in the accessory field.

Agents and dealers are destined to make fortunes out of it. There is still some unoccupied territory. Write today for our liberal dealers' and agents' proposition.

PRICE, $5.00

Shipped anywhere in the United States.

EVAPCO MFG. COMPANY

429 Grand River Ave. Detroit, Mich.

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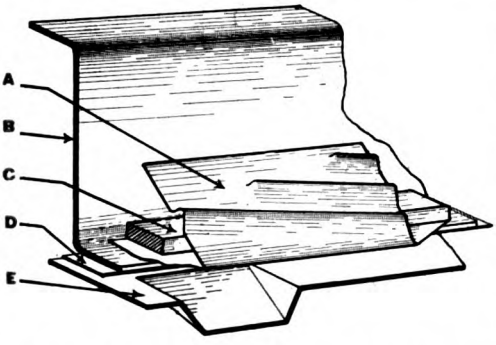
25%—50%

Oil-Saving Guaranteed on Fords

THE E. M. WHITE OIL DISTRIBUTOR

is a new device which without question makes a greater actual improvement on Ford cars than any other Ford accessory ever produced.



WHAT IT WILL ACCOMPLISH

It will actually produce a saving of from 25 to 50% in the oil consumption on any Ford. This is guaranteed. It will reduce the formation of carbon to the minimum and prevent fouling of the spark plugs. These troubles have been particularly bothersome in the front cylinder on a large majority of Fords. This oil distributor overcomes it. By giving proper oil distribution under every condition, it positively prevents both overlubrication and scanty lubrication which conditions cause a large proportion of Ford lubrication difficulties. It improves the running qualities of the motor, lengthens its life and actually saves gasoline.

WHO INVENTED IT.

E. M. White is the inventor, a man recognized as a foremost authority in this country on automobile lubrication. His lubrication systems are used on a large number of the finest cars, including the highest priced car made in America. His name alone is sufficient guarantee of its merit.

HOW IT WORKS

It consists of a series of troughs made of copperized steel combined to form a single unit and placed inside the crank case, on the right hand side. The oil splashed from the small pockets by the cranks is carried by the troughs rearwardly step by step to the main reservoir or fly wheel housing. This movement of the oil rearwardly prevents the accumulation of lubricating oil under the cranks especially number one crank, and insures proper lubrication of the motor whether the car be ascending or descending a grade, thus overcoming ninety per cent of the lubrication difficulties of the Ford motor. It positively overcomes so-called "oil pumping"—a common difficulty. And all for $3.00. Where can you equal this value?

HOW IT IS INSTALLED

"A" shows the oil distributor slipped between bottom of the crank case "B" and the reinforcing strip "C." Can be installed in twenty-five minutes by anyone without even raising the hood or dismantling the motor. Simply remove hand hole cover from bottom of crank case "E," slip in the oil distributor and return plate to position.

It is extremely simple, but almost miraculously efficient. Will soon be considered a necessity on every Ford. Dealers will find it the most profitable accessory they have ever handled. One of the largest accessory distributors in the country has written us a letter stating that if this oil distributor will do half what is claimed it will be the fastest selling Ford accessory ever put on the market. And the results we claim are—

ABSOLUTELY GUARANTEED

If results claimed are not accomplished, purchaser will receive his full purchase price back at any time within thirty days from date of purchase.

DEALERS WANTED

Retail price $3.00. Liberal Discount to dealers, agents and jobbers. Write today.

EVAPCO MFG. COMPANY

429 Grand River Ave. Detroit, Mich.

SOLE DISTRIBUTOR

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THE FIRST ECONOMY DEVICE

To be Officially Endorsed by the

American Automobile Association as a Practical and Efficient Gasoline Saver

AER-IN The Assistant Carburetor

Has shown a proved increase in mileage of 26.8% under the most adverse conditions.

This is official. **Under favorable conditions it has shown as high as**

65% increase in Mileage

Enthusiastic users report even better results.

BE SURE OF THE DEVICE YOU SELL

You cannot be too careful in recommending to your customers devices which claim to save gasoline and add power, speed and flexibility to the engine. Private tests and enthusiastic testimonials are not always exact. But the expert, exhaustive and unbiased

OFFICIAL TEST AND ENDORSEMENT OF THE A. A. A. IS UNQUESTIONED PROOF

No one can go back of it. It means that you can recommend AER-IN to your customers as a guaranteed saver of gas, without the slightest hesitation. And back of this official proof

WE GUARANTEE SATISFACTION OR REFUND THE PURCHASE PRICE

We authorize all our dealers to offer this same guarantee. We are willing they or their customers compare AER-IN with any other similar device on the market, and will abide by the result.

YOU SHOULD STOCK AER-IN AT ONCE

It permits the engine to automatically help itself to as much air as is needed to get the greatest efficiency out of the gasoline. No other device responds exactly in proportion to the needs of the engine. It is adjusted at the factory and cannot be tampered with. It will never come back to you, because it has no leather or fibre to wear out by vibration or be destroyed by backfire and gas vapor. It is the only auxiliary carburetor that is fool proof and that will outwear the car.

OUR ADVERTISING DIRECTS CUSTOMERS TO YOU

The dealer, the garage man, is the logical person to install such a device and be paid for doing so. We tell our customers to go to you. The high price of gasoline is a very live issue. AER-IN is the guaranteed, only officially tested saver of it. Your position is clear—your sales should be large and we stand behind you in every sale you make. Write for prices and particulars at once.

WARE BROTHERS

Manufacturers and Patentees

Established Ten Years

Office and Factory, 224 No. Ada St., Chicago

Send This Coupon Today

WARE BROTHERS,
224 No. Ada St., Chicago.

Please send me full particulars of AER-IN, the Assistant Carburetor, and quote me special dealers' price at once, and indicate territory that is still open in my vicinity.

Name .....

Address .....

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MIXERS (Continued)

FUEL MIXERS, ECONOMIZERS OR AGITATORS (Continued)

STANLEY—See Deppe, W. P.

STEWART Machine Works, Alfred C., Tenth & Santee Sts., Los Angeles, Cal.

U. S. E.—See Universal Shock Eliminator.

UNIVERSAL Device Co., Three Rivers, Mich.
(See page 797.)

UNIVERSAL Shock Eliminator, 6-8 W. 62d St., New York, N. Y. "U. S. E."

UNIVERSAL Trolley Wheel Co., 181 King St., Northampton, Mass.

V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo.

VAPOR Gasket Co., Erie, Pa. "Lang."

VAPORETER Sales Co., Real Estate Trust Bldg., Philadelphia, Pa.

VIGOR—See American Automobile Specialty Co.

WARE Bros., 224 N. Ada St., Chicago, Ill. "Aer-In."
(See page 339.)

WHITTELSEY Co., 17 Battery Pl., New York, N. Y.

WILSON Vaporizer Co., Roslyn, Pa.

YORK Gas Saver Co., 1518 E. Jefferson Ave., Detroit, Mich.

MOISTENERS

AIR OR MIXTURE MOISTENERS

(For feeding water into the intake manifold)

AUTO Gas Saver Co., Desk E. 540 National Life Bldg., Chicago, Ill. "Vapo-Humidifier."
(See page 507.)

AXTELL, F. C., Marsh-Strong Bldg., Los Angeles, Cal.

BALZER & Son, Andover, N. J. "Powac."

BAUM, C. R., 1311-13 Baltimore Ave., Kansas City, Mo.

CASEY Asco Mfg. Co., 1504 Grand Ave., Kansas City, Mo. "Dublservis."

COMFORT Motor Machine Co., 715 Galapago St., Denver, Colo.

DEITZ Carburetor Co., 416 W. Fourth Ave., Denver, Colo.

DUBLSERVIS—See Casey Asco Mfg. Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GRELCO—See Grothe Electric Co.

GROTHE Electric Co., 822 Jefferson St., Burlington, Ia. "Grelco."

H_2O Mfg. Co., Cambridge, Mass.

LITTLE WONDER—See Muir Co.

MUIR Co., R. L., Broad & Race Sts., Philadelphia, Pa. "Little Wonder."

POPP Mfg. Co., M. L., 343-45 33d Ave., Milwaukee, Wis.

POWAC—See Balzer & Son.

SHUMAKER Motor Car Co., J. T., 383 Canterbury Rd. Rochester, N. Y.

VAPO-HUMIDIFIER—See Auto Gas Saver Co.

MONOGRAMS

ORNAMENTAL METAL MONOGRAMS

AUTOGRAMS—See Wood-Detroit Mfg. Co.

BALZER Co., Gus, 1777 Broadway, New York, N. Y.

BERNARD Co., J., 423-30 E. 53d St., New York, N. Y.

COLGAN Co., J. W., Sudbury Bldg., Boston Mass.

CREUTZ Plating Co., Fifth & Elm Sts., Cincinnati, O.

CROWE Name Plate & Engraving Co., Chicago, Ill.
(See page 699.)

FINE Co., Horace E., 19 E. State St., Trenton, N. J.

GREENDUCK Co., Van Buren & Hoyne Aves., Chicago, Ill.

HANDEL Co., Louis, 133 Center St., New York, N. Y.

HANSON Co., C. H., 173 N. Clark St., Chicago, Ill.

HICKOK Mfg. Co., 38 St. Paul St., Rochester, N. Y.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

JOHNSTON Co., J. G., 79 Sudbury St., Boston, Mass.

MATTHEWS & Co., Jas. H. (Forbes Field), Pittsburg, Pa.

MURDOCK, Jr. Co., James, 116 Opera Pl., Cincinnati, O.

NEW YORK Stencil Works, 100 Nassau St., New York, N. Y.

REES, F. H., 335 E. Main St., Rochester, N. Y.

SALMAN, John A., 17-21 Bromfield St., Boston, Mass.

SCHRIDDE, Wm., 35 S. Clark St., Chicago, Ill

SCHWERDTLE Stamp Co., 39-41 Cannon St., Bridgeport, Conn.

STAFFORD Co., N., 67 Fulton St., New York, N. Y.

WALTER & Sons, N. C., 3 Park Row, New York, N. Y.

WHITEFORD & Co., Jos. G., 165 N. Jefferson St., Chicago, Ill.

WOOD-DETROIT Mfg. Co., 64-68 W. Congress St., Detroit, Mich. "Autograms."

MOSS

UPHOLSTERY MOSS

BABIN, Luke B., White Castle, La.

KOHLMANN Moss & Cotton Felt Mfg. Co., 1224-30 St. Thomas St., New Orleans, La.

WOLL & Sons Mfg. Co., Peter, Hancock & Berks Sts., Philadelphia, Pa.

Complete Index to Classification appears on Pages 8 to 27.

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Get This World's Greatest Seller Before It Is Too Late

Compensating Vapor Plug

Proved Savings—Or Your Money Back

"30% More Speed"
"30% More Power"
"40% More Mileage"
Less Carbon

$5 Parcel Post Prepaid

$7.00 in Canada

750,000 Compensating Vapor Plugs Sold Since January
This Means a Total Business in Four Months of $3,750,000

All this done because of our famous guarantee—Proved Savings, or Your Money Back—and because the Compensating Vapor Plug is adding speed, power and gasoline mileage to every automobile, wherever it is used. It is the biggest money saver that has ever been offered automobile owners, and it is the biggest guarantee of better service from your motor cars.

The quantity of mail has been so great that we have been compelled to send it to our distributors by EXPRESS so that they could take care of the orders immediately.

600,000 orders in the Winter season, when the majority of cars are laid up, is tremendous. One dealer wired: "Last shipment 500 Vapor Plugs gone in a week—rush 1,000 by express." Another wired: "Sending certified check for $1,000—rush order."

And the majority of users are writing us, saying that our figures are not high enough—that they are getting greater economy than we claim.

Here Is What Users of the Compensating Vapor Plug Say—Read Their Letters

You Can Attach It in Five Minutes—It Fits Any Car—Never Wears Out—You Simply Tap Hole in Manifold and Screw in Plug

Enough Said
Green Lake, Wis.

Automatic Carburetor Co.,
Chicago, Ill.

Gentlemen: Your statements for the plug in regards to speed, power and mileage are true.

B. F. DE HOSSON.

Results Exceed Claims
Chicago.

I find that the results exceed your claims in the flexibility of the motor, mileage per gallon of gasoline and power.

H. M. POWER.

Pronounces It O. K.
Detroit, Mich.

On a straightaway drive over country roads I covered 32 miles on three-quarters of a gallon of gasoline. But the thing that impresses me most is the increased flexibility—slowing down to 3 miles an hour, and picking up without an effort, and with no fear of stalling. That of itself makes the device worth while.

LEN G. SHAW.

Here's Real Economy
St. John's, Portland, Ore.

It increased our mileage nine and one-half miles per gallon gasoline.

WHITNEY ROSE.

42 Per Cent More Mileage
Athens, Ga.

I personally tested this plug for mileage with and without the plug, and it shows about 42 per cent. more mileage.

L. J. FLUKER.

La Porte, Ind.

I tested out your carburetor yesterday on my Overland car, making a 24-mile run before attaching the plug, using nine quarts of gasoline; speed with top up and side curtains on, 37 miles.

I attached the plug, made the same run, using six quarts of gasoline, speed 42 miles.

C. E. WOLFE.

Does More Than Promised
Elgin, Ill.

I have given thorough tryout to your Compensating Vapor Plug under the most severe weather and find that it does more than promised.

GEO. H. ANDRESEN.

Will Benefit Any Car
Barre, Mass.

I am convinced from the way my motor starts and the smoothness with which it runs, the Vapor Plug is a great benefit to any motor car.

D. A. BREEN.

Results Beyond Expectations
Ashland, Ohio.

I am pleased to say that it gives results beyond anything I expected. Three or four car owners have already asked for your address and I feel sure that they are ready to purchase.

R. T. SCANTLEBURY.

Wanted Exclusive Dealers

The Compensating Vapor Plug will sell like wildfire to every car owner. Exclusive contracts for counties. As soon as you get your contract we will prove results on cars in your territory—ready for you to start sales. We will back you with big national and local advertising. Prove to us that you are the best equipped and responsible. Write, wire, phone or jump the first train for Chicago—get this fastest selling accessory—a money-saver for any car owner and a money-maker for you.

You Want This Money-Saver For Your Car

The price is $5 to you and to everybody—and all we ask is that you send us the coupon with a $5 check, P. O. or express order attached—as a *deposit*—until you are more than satisfied. $7 in Canada. If after a 30-day trial you decide you can do without the **Compensating Vapor Plug**, simply send it back and we will refund your full deposit.

Tear or cut off the coupon—mail it now—today.

AUTOMATIC CARBURETOR CO.
2017 Michigan Avenue Chicago, Ill.
Makers of Famous Automatic Carburetors
Specialists in Gasoline Devices for Motors
CANADIAN DISTRIBUTING CO.
125 Pacific Avenue Winnipeg, Manitoba

Cut This Out—Mail Today
AUTOMATIC CARBURETOR CO.
Dept. F, 2017 Michigan Ave., Chicago, Ill.

Enclosed find $5 ($7 in Canada) in full payment for one **Compensating Vapor Plug**—with the understanding that you guarantee it for life and will refund my deposit in full if I return your device to you collect within 30 days.

I use a.....sized carburetor; name of car...model...year...
Name .....
Address .....
I recommend as a good dealer .....of.....

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MOTORS

ELECTRIC AUTOMOBILE MOTORS

DIEHL Mfg. Co., Elizabethport, N. J.

GENERAL Electric Co., Schenectady, N. Y.

WAGNER Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

GASOLINE AUTOMOBILE MOTORS

AUTO Engine Works, St. Paul, Minn.
(See page 219.)

BEAVER Mfg. Co., First St. & Oklahoma Ave., Milwaukee, Wis.

BRADLEY Motor Co., C. M., Harvey, Ill.

BRENNAN Motor Co., 105 Grape St., Syracuse, N. Y.

BUDA Co., Harvey, Ill.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CAILLE Perfection Motor Co., Second & Amsterdam Aves., Detroit, Mich. "Pioneer.

CHRISTENSEN Engineering Co., 841-47 30th St., Milwaukee, Wis.

CLARK Engine & Boiler Co., Kalamazoo, Mich.

CONTINENTAL Motors Co., Detroit, Mich.
(See page 185)

DART Motor Truck Co., Ainsborough & Stratford Aves., Waterloo, Ia.

DAVIS Mfg. Co., 57th Ave. & Mitchell St., West Allis, Wis.

DUNN Motor Works, 61 Main St., Ogdensburg, N. Y.

DUESENBERG Motor Co., 2259 Oakdale Ave., Chicago, Ill.

ERGON—See Russell, F. Dean.

FALLS Machine Co., Sheboygan Falls, Wis.
(See pages 300 and 301.)

FERRO Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

FRISBIE Motor Co., 56 College St., Middletown, Conn.

GOLDEN, Belknap & Swartz Co., 1248-60 Grand River Ave., Detroit, Mich.

HERCULES Motor Mfg. Co., Canton, O.

HERMANN Engineering Co., 654 Franklin St., Detroit, Mich.

HERSCHELL-SPILLMAN Co., North Tonawanda, N. Y.
(See page 493.)

HOOSIER Motor Co., 612-14 E. Madison St., Goshen, Ind.

JENKS—See Port Huron Construction Co.

KEMP Machine Works, 1215 S. Franklin St., Muncie, Ind.

LE ROI—See Milwaukee Machine Tool Co.

LIGHT Mfg. & Foundry Co., Pottstown, Pa.
(See page 403.)

LYCOMING Foundry & Machine Co., Williamsport, Pa.
(See page 715.)

MASSNICK-PHIPPS Mfg. Co., 1091 Lafayette Ave., E., Detroit, Mich. "Perkins."

MILWAUKEE Machine Tool Co., Milwaukee, Wis. "Le Roi."
(See page 851.)

MODEL—See Pittsburgh Model Engine Co.

MONARCH Motor Mfg. Co., 4636 W. Madison St., Chicago, Ill.

NIAGARA Motors Corp., Niagara Blvd., Dunkirk, N. Y.

NORTH American Motor Co., Pottstown, Pa.
(See page 833.)

NORTHWAY Motor & Mfg. Co., 510-14 Maybury Grand Ave., Detroit, Mich.

OULTON Mfg. Co., 311 Atlantic Ave., Boston, Mass.

PALMER-MOORE Co., 100 N. Geddes St., Syracuse, N. Y.

PERKINS—See Massnick-Phipps Mfg. Co.

PIONEER—See Caille Perfection Motor Co.

PITTSBURGH Model Engine Co., Pittsburgh, Pa. "Model."

PORT HURON Construction Co., Port Huron, Mich. "Jenks."

REGAL Gasoline Engine Co., Coldwater, Mich.

RELIABLE Engine Co., Portsmouth, O.

ROCHESTER Motors Co., 5 Wren St., Rochester, N. Y.

RUSSELL, F. Dean, Schearer St., Rochester, N. Y. "Ergon."

RUTENBER Motor Co., Marion, Ind.
(See page 343.)

SOMMER Motor Co., Bucyrus, O.

STERLING Motor Co., Detroit, Mich.
(See page 751.)

TEETOR-HARTLEY Motor Co., Hagerstown, Ind.

TURBINE Engine Mfg. Co., 324 S. Canal St., Chicago, Ill.

UNIVERSAL Motor Co., 39 Ceape St., Oshkosh, Wis.

VAN BLERCK Motor Co., Monroe, Mich.

WAUKESHA Motor Co., Waukesha, Wis.
(See page 381.)

WEIDELY Motor Co., Georgia & Shelby Sts., Indianapolis, Ind.

WISCONSIN Motor Mfg. Co., Station A, Dept. 324, Milwaukee, Wis.
(See page 357.)

WOLLASTON Foundry Co. (Norfolk Downs), Quincy, Mass.

STEAM AUTOMOBILE MOTORS

(See Engines, Steam)

MOULDING

BRASS MOULDING

BRIDGEPORT Brass Co., Bridgeport, Conn.

COWLES & Co., C., New Haven, Conn.
(See page 257.)

DOUGLAS & Lomason Co., Detroit, Mich.

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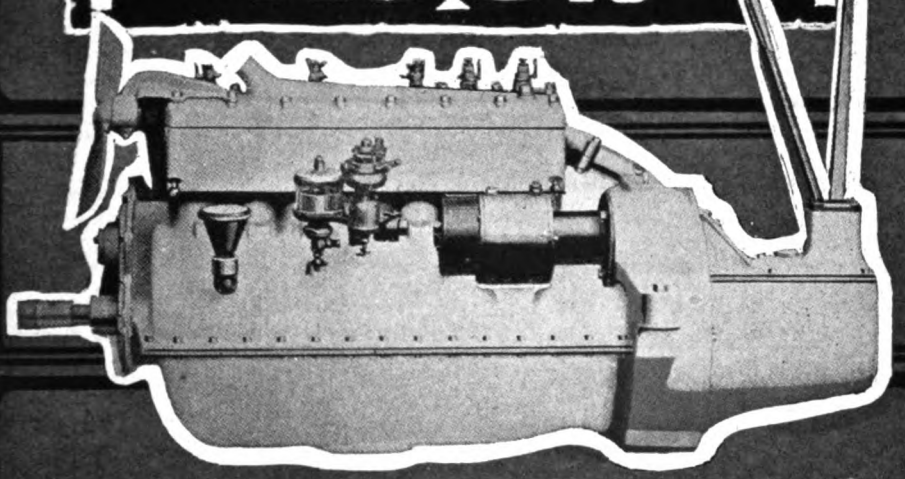
THE RUTENBER MOTOR



The exceptionally low price of Rutenber Motors is possible only because of the large demand which compels a quantity production.

For sixteen years we have specialized in the building of light, rugged and powerful motors which would give a maximum service at the minimum operating and upkeep expense.

The evidence of our success is seen in the fact that the best lightweight American cars use Rutenber Motors and satisfy the exacting requirements of experienced motorists.

Model 25—3⅛″—bore 5″ stroke—6 cylinders
Model 20—3½″—bore 5″ stroke—4 cylinders

RUTENBER MOTOR CO.
MARION - - INDIANA

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MOULDING (Continued)

BRASS MOULDING (Continued)

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

JONAH & George, Merrimac, Mass.

MANHATTAN Brass Co., 328 E. 28th St., New York, N. Y.

METAL Stamping Co., 12th St. & Boulevard, Long Island City, N. Y.

RANDOLPH-CLOWES Co., Waterbury, Conn

ROME Brass & Copper Co., Rome, N. Y.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

RUNNING BOARD MOULDING

(See also Moulding, Brass; also Moulding, Steel)

ALITE—See Zenite Metal Co.

ALUMINUM Co. of America, Pittsburg, Pa. (See page 479.)

BRIDGEPORT Brass Co., Bridgeport, Conn.

DAHLSTROM Metallic Door Co., Buffalo & E. Second Sts., Jamestown, N. Y. (See page 545.)

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

KAWNEER Mfg. Co., Niles, Mich.

METALLIC Automobile Matting Co., Rochester, N. Y. (See page 329.)

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

WATERBURY Brass Goods Corp., 160 Washington Ave., Waterbury, Conn.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

ZENITE Metal Co., 201-05 N. West St., Indianapolis, Ind. "Alite." (See page 409.

STEEL MOULDING

DAHLSTROM Metallic Door Co., Buffalo & E. Second Sts., Jamestown, N. Y. (See page 545.)

MUFFLERS

EXHAUST MUFFLERS

A-Z Co., 530 W. 50th St., New York, N. Y. (See page 417.)

ANTI-EXPLO—See Gemco Mfg. Co.

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

CONSOLIDATED Gas & Electric Co., 552 W. Lake St., Chicago, Ill. "Non-Clog."

DUNKIRK Corp., Dunkirk, N. Y. "Ejector."

EJECTOR—See Dunkirk Corp.

EVER CLEAN—See Miller & Co.

FORSYTH Bros. Co., Chicago, Ill. (See page 241.)

G. P. & F.—See Geuder, Paeschke & Frey Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Anti-Explo." (See page 127.)

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis. "G. P. & F." (See page 479.)

GRAY-HAWLEY Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

KELLS Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 261.)

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 617.)

MAXIM Silencer Co., 115 Homestead Ave., Hartford, Conn. (See page 623.)

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MILLER & Co., Spring Valley, Ill. "Ever Clean."

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

MOLINE Muffler Mfg. Co., 414 16th St., Moline, Ill.

NON-CLOG—See Consolidated Gas & Electric Co.

OLDBERG Mfg. Co., Detroit, Mich. (See page 345.)

POWELL Muffler & Timer Co., 312-14 Catherine St., Utica, N. Y. (See page 357.)

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

TROIKE Muffler & Mfg. Co., Lorain, O.

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

XARDELL Bros. Co., 28 Broadway, Utica, N. Y.

YANKEE Co., 69 Genesee St., Utica, N. Y.

THROAT MUFFLERS

BRADLEY Knitting Co., Delavan, Wis.

NAILS

UPHOLSTERY NAILS

(See Tacks, Upholstery)

NIPPLES

PIPE NIPPLES

(See Fittings, Pipe)

PUMP NIPPLES

(See Connections, Tire Pump

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OLDBERG Mufflers

The Advantage of Oldberg Special Service

This service was developed to put the production of mufflers of special design or special application on the same basis of delivery as the regular standard OLDBERG models.

As muffler manufacturers we are as jealous of our specialty as any other part maker is of his, but as business men we cannot see why the motor car designer should be compelled to design the other important chassis details to accommodate muffler standards—or why the design should revamp an otherwise perfect layout in case he neglects to provide for the muffler's installation or when such provision as he has made proves inadequate.

OLDBERG SPECIAL SERVICE

has become such an important factor in our facilities that our prices on special work show an almost negligible advance over the price of OLDBERG standards.

Oldberg Manufacturing Company

DETROIT :: MICHIGAN

The following Manufacturers use Oldberg Mufflers exclusively:

Bartholomew Co.
Bell Motor Car Co.
Bessemer Motor Truck Co.
Briscoe Motor Corporation.
Chase Motor Truck Co.
Connersville Wheel Co.
Daniels Motor Car Co.
Denby Motor Truck Co.
Denneen Motor Truck Co.
Detroit Chassis Co.
Detroiter Motor Car Co.
Detroit-Wyandotte Motor Car Co.
Dort Motor Car Co.
Drummond Motor Co.
Empire Auto Co.
Enger Motor Car Co.
Gadabout Motor Co.
Globe Motor Truck Co.
Hewitt-Ludlow Auto. Co.
Hudson Motor Car Co.
Hupp Motor Car Co.
Inter-State Motor Car Co.
Kentucky Wagon Mfg. Co.
King Motor Car Co.
The H. A. Lozier Co.
Marion Motor Car Co.
Mich. Steel Boat Co.
Monroe Motor Car Co.
Moon Motor Car Co.
Morton Motor Co.
Oakland Motor Car Co.
Olds Motor Wks.
Paige-Detroit Motor Car Co.
Palmer-Meyer Motor Car Co.
Pathfinder Co.
Premier Motor Car Co.
Regal Motor Car Co.
Sayers & Scovill Co.
Scripps-Booth Co.
Sterling Motor Truck Co.
Sun Motor Car Co.
Universal Motor Truck Co.
Vim Mfg. Co.

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AIR UPHOLSTERY CLEANING NOZZLES

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

ROMORT Mfg. Co., 1810 Westlake Ave., Seattle, Wash.
(See page 450.)

NUMBERS

LAMP NUMBERS

BALZER Co., Gus, 1777 Broadway, New York, N. Y.

FINE Co., Horace E., 19 E. State St., Trenton, N. J.

LICENSE NUMBERS OR HANGERS

(For License Holders—See Holders License)

ABBOTT Stamping Co., Dime Bank Bldg., Detroit, Mich.

ALUMINUM Goods Mfg. Co., Manitowoc, Wis.

BALTIMORE Enamel & Novelty Co., ft. Allen St., Baltimore, Md.

BALZER Co., Gus, 1777 Broadway, New York, N. Y.

ENAMELED Steel Sign Co., 222 N. State St., Chicago, Ill.

FINE Co., Horace E., 19 E. State St., Trenton, N. J.

INGRAM-RICHARDSON Mfg. Co. Beaver Falls, Pa.

LIMERICK Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

MURDOCK, Jr. Co., Jas., 116 Opera Pl., Cincinnati, O.

NIAGARA Falls Metal Stamping Works, 245 Tenth St., Niagara Falls, N. Y.

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

ROYAL Enameling & Mfg. Co., 826 W. Madison St., Chicago, Ill.

STAFFORD Co., N., 67 Fulton St., New York, N. Y.

STILLMAN, A. P., 253 Jay St., Brooklyn, N. Y.

WHITEFORD & Co., Jos. G., 165 N. Jefferson St., Chicago, Ill.

NUTS

CASTELLATED NUTS

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

BRIGHTMAN Mfg. Co., Columbus, O.

BRIGHTMAN Nut & Mfg. Co., Sandusky, O.
(See page 347.)

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill.
(See pages 287 and 443.)

CLARK Bros. Bolt Co., Milldale, Conn.
(See page 119.)

COLUMBIA Nut & Bolt Co., 1550 Railroad Ave., Bridgeport, Conn.

DETROIT Screw Works, Detroit, Mich.
(See page 849.)

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

GARLAND Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburg, Pa.

GRAHAM Nut Co., 1317-19 W. Carson St., Pittsburg, Pa.

MILTON Mfg. Co., Milton, Pa.

NATIONAL-ACME Mfg. Co., Cleveland, O.
(See page 441.)

NATIONAL Bolt & Nut Co., Pittsburg, Pa.

PHILLIPS Mfg. Co., R. B., Worcester, Mass.

RHODE Island Tool Co., Providence, R. I.

RUSSELL, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

UPSON Nut Co., Unionville, Conn.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.
(See page 441.)

WORCESTER Machine Screw Co., 79 Beacon St., Worcester, Mass.

FINISHED AND CASE HARDENED NUTS

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

ATLAS Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

BRIGHTMAN Mfg. Co., Columbus, O.

BRIGHTMAN Nut & Mfg. Co., Sandusky, O.
(See page 347.)

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill.
(See pages 287 and 443.)

CINCINNATI Screw Co., Twightwee, O.
(See page 571.)

CLARK Bros. Bolt Co., Milldale, Conn.
(See page 119.)

COLUMBUS Bolt Works Co., Columbus, O.
(See page 119.)

DETROIT Screw Works, Detroit, Mich.
(See page 849.)

GARLAND Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburg, Pa.

GRAHAM Nut Co., 1317-19 W. Carson St., Pittsburg, Pa.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn.
(See page 383.)

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

MILTON Mfg. Co., Milton, Pa.

NATIONAL-ACME Mfg. Co., Cleveland, O.
(See page 441.)

NATIONAL Bolt & Nut Co., Pittsburgh, Pa.

NATIONAL Screw & Tack Co., Cleveland, O.
(See page 119.)

PAWTUCKET Mfg. Co., 337 Pine St., Pawtucket, R. I.

PENINSULAR Milled Screw Co., 1090 Lafayette St. E., Detroit, Mich.

PITTSBURG Screw & Bolt Co., Preble Ave (N. S.), Pittsburg, Pa.

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Reliance Lock Washers

"Type B"

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Most complete line of types and sizes on the market. Highest quality, prompt shipments and absolutely guaranteed.

THE RELIANCE MANUFACTURING COMPANY

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Peoples Gas Bldg.

Positive

The POSITIVE Lock Washer

Plain

Made in all sizes and weights for Automobile purposes. Can be used thinner than any other lock washer—effective, no matter how thin. One lock under the nut and head can be used if so desired. Exhaustive tests, covering a period of nearly 26 years on railroad track, drop presses, Automobiles and machinery subject to vibration, have proven its superiority over every nut lock manufactured. We also make S. A. E. Standards and Plain Lock Washers of all sizes. *Write for samples and price.*

POSITIVE LOCK WASHER CO., Newark, N. J.

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Milled Steel Bar Nuts

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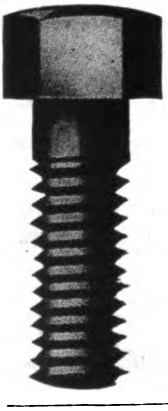

All cap screws milled from solid steel bar, with cut threads

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FILLISTER " " "
ROUND " " "

CLEVIS PINS
SPECIAL PARTS
FLAT HEAD CAP SCREWS

Inquiries receive prompt attention—Write for catalog

AUTOMATIC PRODUCTS COMPANY

Manufacturers of

Screw Machine Products

DETROIT 22-24 Dubois St. MICHIGAN

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NUTS (Continued)

FINISHED AND CASE HARDENED NUTS (Continued)

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

RHODE Island Tool Co., Providence, R. I.

RUSSELL, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 441.)

LOCK NUTS AND WASHERS

ABSOLUTE—See American Lock-Nut Co.

AMERICAN Lock-Nut Co. (Pullman Station), Chicago, Ill. "Absolute."

AMERICAN Nut & Bolt Fastener Co., Pittsburg, Pa. "Bartley."

BARTLEY—See American Nut & Bolt Fastener Co.

BULL DOG—See Daniels Safety Device Co.

CINCINNATI Screw & Tap Co., 2442 Beekman St., Cincinnati, O.

COLUMBIA Nut & Bolt Co., 1550 Railroad Ave., Bridgeport, Conn. "Gib."

DANIELS Safety Device Co., 20 S. La Salle St., Chicago, Ill. "Bull Dog."

GIB—See Columbia Nut & Bolt Co.

H. P. L. Washer & Safety Bolt Mfg. Co., 121 Charlotte St., Lancaster, Pa.

HOBBS Mfg. Co., Worcester, Mass.

HOLDFAST Nut Co., 344 S. Hoyne Ave., Chicago, Ill.

NATIONAL Lock Washer Co., Johnson & Herman Sts., Newark, N. J.

NATIONAL Umbrella Frame Co., 30th & Thompson Sts., Philadelphia, Pa. "Never Slip."

NEVER SLIP—See National Umbrella Frame Co.

O. K. Nut Lock Co., Turks Head Bldg., Providence, R. I.

POSITIVE Lock Washer Co., Newark, N. J. (See page 347.)

QUADRIGA Mfg. Co., 213-21 W. Grand Ave., Chicago, Ill.

RELIANCE Mfg. Co., Massillon, O. (See page 347.)

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SHEKLETON—See Stanley Works.

STANLEY Works, New Britain, Conn. "Shekleton." (See page 269.)

STEEL Specialties Co., 79 Milk St., Boston, Mass. "W. W. W."

TORSION Nut-Lock & Washer Co., 141 Milk St., Boston, Mass.

U. S. Lock Washer Co., 34-36 Brenner St., Newark, N. J.

W. W. W.—See Steel Specialties Co.

THUMB OR WING NUTS

ATLAS Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

BILLINGS & Spencer Co., Hartford, Conn.

CHICAGO Nut Co., 2513-39 W. 20th St., Chicago, Ill.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 287 and 443.)

CLARK Bros. Bolt Co., Milldale, Conn. (See page 119.)

CLEVELAND Wrought Washer Co., 3590 W. 58th St., Cleveland, O.

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

CORBIN Screw Corp., New Britain, Conn. (See page 831.)

DETROIT Screw Works, Detroit, Mich. (See page 849.)

DEVLIN Mfg. Co., Thos., Third & Lehigh Aves., Philadelphia, Pa.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

GARLAND Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburg, Pa.

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

PENINSULAR Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

PETRY Co., N. A., Philadelphia, Pa. (See page 561.)

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

UPSON Nut Co., Unionville, Conn.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 441.)

WHITMAN & BARNES Mfg. Co., Akron, O.

OILS

LUBRICATING OILS

A-B-C—See Layton Park Oil & Soap Co.

ACHESON Oildag Co., Port Huron, Mich. "Oildag."

ADMSCO—See Millers Sons Co.

ADVANCE Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.

ALBANY Lubricating Co., 708-710 Washington St., New York, N. Y.

ALEXANDER & Co., H. T., 17 Battery Pl., New York, N. Y. "Grand Prix."

AMALIE—See Sonneborn Sons.

AMERICAN Oil Co., Jackson, Mich. "Amoco."

AMERICAN Solidified Oil Works, Post Office Sq., Boston, Mass.

AMOCO—See American Oil Co.

ARCO—See Atlantic Refining Co.

ATLANTIC Refining Co., Euclid Ave. & E. 65th St., Cleveland, O. "Arco."

ATLAS—See Swan & Finch Co.

AURORA—See Pigot-Sayre Co.

AUTLUBO—See Moore Oil Co.

AUTO Oil Co., 172 S. Water St., Jackson, Mich. "Diamond Cross."

Complete Index to Classification appears on Pages 8 to 27.

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EMPIRE

Quality Light Six - $1095
High Powered Four - $975

These two models comprise the Empire Line for 1916. They are Quality cars throughout, sold on a sales proposition that makes the Empire Line especially attractive to the dealer. Full literature and details upon request.

Empire Automobile Co.

"Sixth Year of Continued Growth"

Indianapolis Indiana

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Backed with forty-three years' manufacturing experience, eight years of building motor cars.

Unit power plant—silent, powerful, long stroke four-cylinder motor, 3½" x 5", three point suspension—114 in. wheel base—full floating rear axle—Delco Ignition—complete electric starting and lighting system—large roomy full length seats—one man top—demountable rims—speedometer, tools, jack, etc.

Made in two designs—Five-Passenger Touring Car and Three-Passenger Cloverleaf Roadster.

Write for complete information regarding agency proposition.

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Elkhart, Ind.

FOSTORIA *Light Car*
$735
COMPLETELY EQUIPPED

The Surprise Car for 1917

The new series of Fostoria Light Cars includes the following models, completely equipped in every particular.

Touring Car $735
Delivery Wagon—open body..... 695
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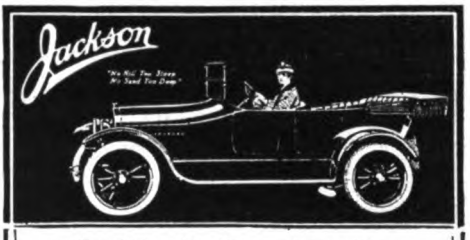
Contracts are now being made for 1917. Write for details of our dealers' proposition and new catalog fully describing the new line.

THE FOSTORIA LIGHT CAR CO.

Arizona Ave. Fostoria, Ohio



Send for the facts about the Jackson Line—

HIGH DUTY FOUR $985

Jackson "34" goes through deep sand as easily as a sharp knife goes through thin paper. It glides up hills like a flying-machine. It is fit and eager to tackle anything in the way of roads. It is as *quiet* as it is *powerful* and *flexible*, because every reciprocating part is in perfect *"balance."*

New Light Weight "Eight" $1195

Jackson Model "348" meets every demand for a high quality, light-weight 5-passenger "Eight." It has the same long-stroke, high duty, balanced type of motor as model "34." Wheel base 112 inches—a truly remarkable car in every way. $1195.

New Seven-Passenger "Eight" $1685

Model "68" Jackson—a big "Eight"—124 in. wheel base. In comfort, luxury, power, design and equipment it compares with any "eight" at any price. And you get greater value in the Jackson "Eight." 70 H. P.

Jackson Automobile Co.

Jackson, Mich.

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OILS (Continued)

LUBRICATING OILS (Continued)

AUTO-USE-IT—See Sawyer Oil Co.

AUTOLINE—See Robinson & Son Co.

BALKAN—See Jones & Bro., J.

BALSO Oil Co., 238 Erie St., Toledo, O.

BANNER—See Clarkson & Ford Co.

BAUM'S Castorine Co., 104 N. George St., Rome, N. Y.

BELDEN & Co., A. G., 145 Maiden Lane, New York, N. Y. "Valvone," "Pycnoleum."

BELL Oil Co., 53 E. Ferry St., St. Louis, Mo. "Liberty Bell."

BLIVEN & Carrington, 116 Broad St., New York, N. Y. "Champion."

BLUE RIBBON—See Sawyer Oil Co.

BORNE, Scrymser Co., 80 South St., New York, N. Y. "Colonial."

BUCK & Co., E. A., Worcester, Mass. "Powero."

BULL DOG—See Climax Western Oil Co.

BULLY—See Weinberg & Co.

CALYPSOL—See Cataract Refining & Mfg. Co.

CATARACT Refining & Mfg. Co., Marine National Bank Bldg., Buffalo, N. Y. "Calypsol."

CENTURY—See Davey & Co.

CHAMPION—See Bliven & Carrington.

CLARKSON & Ford Co., 55 Water St., New York, N. Y. "Banner."

CLIMAX Western Oil Co., 2824 Tenth Ave., S., Minneapolis, Minn. "Bull Dog."

COLGAN Mfg. & Supply Co., 42 South St., New York, N. Y.

COLONIAL—See Borne, Scrymser Co.

COLUMBIA Refining Co., 90 West St., New York, N. Y.

COMMODORE—See Miller Co.

CONN-O-CO—See Connecticut Oil Co.

CONNECTICUT Oil Co., 549 S. Leonard St., Waterbury, Conn. "Conn-O-Co."

CONTINENTAL Oil Products Co., 1467 Michigan Ave., Chicago, Ill.

CORTLAND Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Houts Warren."

CRANE & Co., L. M., 91 Oliver St., Boston, Mass. "Eureka."

CRAWFORD Co., Wm. J., 14 Wood St., Pittsburg, Pa.

CREW Levick Co., Land Title Bldg., Philadelphia, Pa. "Perfection."

CROWN—See Great Western Oil Co.

CURROLA—See Curry Bros. Oil Co.

CURRY Bros. Oil Co., 253-55 Franklin St., Boston, Mass. "Currola," "Superba."

CYLOIL—See Ilsley, Doubleday & Co.

DAVEY & Co., 3600 Grand Ave., Chicago, Ill. "Century."

DEARBORN Chemical Co., McCormick Bldg., Chicago, Ill.

DEFIANCE—See Waverly Oil Works Co.

DIAMOND CROSS—See Auto Oil Co.

DRAKE Oil Co., 99 E. Spring St., Titusville, Pa. "Speed-Oil."

DUPLEX—See Enterprise Oil Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

EAGLE Oil & Supply Co., Boston, Mass. "Eagleine."
(See page 827.)

EAGLEINE—See Eagle Oil & Supply Co.

EARLENE—See Franklin Oil Works.

EASTERN Supply Co., Hammond & Canterbury Sts., Worcester, Mass.

EFFICIENCY Oil Products Co., 807 N. Broad St., Philadelphia, Pa.

EMCO—See Emery Mfg. Co.

EMERY Mfg. Co., Bradford, Pa. "Emco."

ENERGINE Refining & Mfg. Co., The Arcade, Cleveland, O.

ENSIGN Refining Co., 10606 Quebec Ave., Cleveland, O.

ENTERPRISE Oil Co., 164 Chandler St., Buffalo, N. Y. "Duplex."

EUREKA—See Crane & Co.

EXCELSIOR—See Miller's Sons.

EXCELSIOR—See Mills Oil Co.

EXPERT—See Warren Refining & Chemical Co.

F. V.—See Wadhams Oil Co.

FAULTLESS—See Hawkeye Oil Co.

FIDELITY Oil Co., 306-10 E. 17th St., Kansas City, Mo.

FISKE Bros. Refining Co., 24 State St., New York, N. Y. "Lubroleine."

FOCO Oil Co., Liberty St., Franklin, Pa. "Focolene."

FRANK Oil Co., 22 W. Spring St., Titusville, Pa.

FRANKLIN Oil Works, E. Atlantic Ave., Franklin, Pa. "Earlene."

FRAZER Lubricator Co., 2921 Normal Ave., Chicago, Ill.

FULCRUM Oil Co., Franklin, Pa.

GARGOYLE MOBILOILS—See Vacuum Oil Co.

GASOL Products Co., 1928-30 N. 20th St., Philadelphia, Pa.
(See page 789.)

GENERAL Oil Works Co., Traction Bldg., Indianapolis, Ind. "Reliable."

GOVOLINE—See Interocean Oil Co.

GRAND PRIX—See Alexander & Co.

GRAPHINOIL—See Winslow Lubricating Co.

GREAT Western Oil Co., 2855 E. 37th St., Cleveland, O. "Nokarbo," "Crown."

GREENSLADE Oil Co., 40 Jefferson Ave., Detroit, Mich. "Packard 24-30."

GULF Refining Co., Pittsburg, Pa. "Supreme."

HAGGERTY Refining Co., 50 South St., New York, N. Y. "Thermo."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

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Brands, "Waverly Special," "Defiance," "Taxi," "Heavy," "Hercules Transmission'

These grades and qualities were established sixteen years ago, and have been maintained without change. They were right then and are right now—they have stood the test of Time and Service. All distilled from Pennsylvania Crude Oil—not acid treated.

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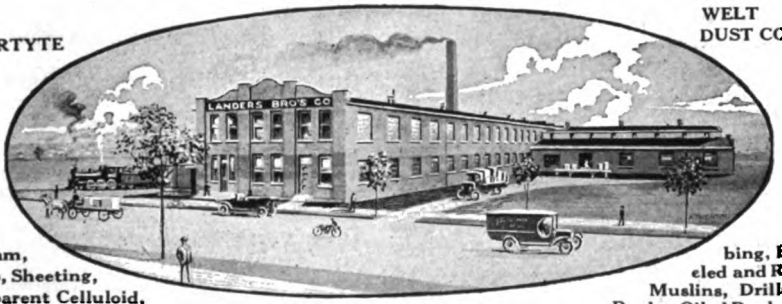

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For over 60 years we have produced high grade lubricants for the most discriminating trade. We offer our high grade Atlas and Crown brands of Motor Oils and our Transmission Lubricant called Gearease at reasonable prices, and with our well known guarantee of quality. Write for Prices. They will interest you.

SWAN & FINCH COMPANY

165 BROADWAY

Works: BAY WAY, NEW JERSEY

Superior Malleable Iron Castings Will Stand This Severe Test

Fig. 6—Wedges Pounded into Scrolls by Blows of 70 Foot-Pounds

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OILS (Continued)

LUBRICATING OILS (Continued)

HARRIS Oil Co., A. W., 326 S. Water St., Providence, R. I.

HAVOLINE—See Indian Refining Co.

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HAWS, George A., 142-44 Front St., New York, N. Y. "Panhard."
(See page 353.)

HINDS & Coon, 124-26 Pearl St., Boston, Mass. "Peach."

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whizoil."

HOUTS WARREN—See Cortland Specialty Co.

HOUGHTON & Co., E. F., 240 W. Somerset St., Philadelphia, Pa.

I. X. L.—See Kramer Oil Co.

IDEAL—See Sheppard, W. S.

ILSLEY, Doubleday & Co., 229-31 Front St., New York, N. Y. "Cyloil."

IMPERIAL Oil Co., 2124 Locust St., St. Louis, Mo.

INDIAN Refining Co., 44 Whitehall St., New York, N. Y. "Havoline."

INTEROCEAN Oil Co., 90 West St., New York, N. Y. "Govoline."

INTERSTATE Chemical Co., 12-20 Bayview Ave., Jersey City, N. J.

INTER-LUBE Chemical Co., 1223 Superior St., Cleveland, O.

INVADER Oil Co., 80 Broad St., New York, N. Y.
(See page 467.)

INVINCIBLE—See Millers Sons Co.

JONES & Bro., J., 429 Locust St., Philadelphia, Pa. "Balkan."

KELLOGG & Co., E. H., 288-48 South St., New York, N. Y.

KENDALL Refining Co., Bradford, Pa.

KEYSTONE Lubricating Co., 21st & Clearfield Sts., Philadelphia, Pa.

KEYSTONE Oil & Mfg. Co., 111 N. Market St., Chicago, Ill.

KOSMOS—See Mulliken Oil Co.

KRAMER Oil Co., W. J., 214-16 Reed St., Milwaukee, Wis. "I. X. L."

LAYTON Park Oil & Soap Co., M. & M. Bank Bldg., Milwaukee, Wis. "A-B-C."

LIBERTY—See Richardson Lubricating Co.

LIBERTY BELL—See Bell Oil Co.

LOOS & Dilworth, 124 S. Front St., Philadelphia, Pa. "Pioneer."

LUBRO Oil Co., 116 Prospect Ave., N. W., Cleveland, O.

LUBROLEINE—See Fiske Bros. Refining Co.

McLEAN-JONES Oil & Supply Co., 40 India Wharf, Boston, Mass. "Swastika."

MAGIE Bros., 110-12 S. Clinton St., Chicago, Ill. "Rock."

MARATHON—See Riverside Oil Co.

MIDDLE States Oil Co., Engineers Bldg., Cleveland, O.

MILLER Co., Wm. P., 244-50 Green St., Brooklyn, N. Y. "Commodore."

MILLER'S Sons, Wm. P., 298-302 Hancock St., Long Island City, N. Y. "Excelsior," "Pan-O-Lite."

MILLERS Sons Co., A. D., Columbus & Preble Aves., Pittsburg, Pa. "Admsco," "Invincible," "Olympia."

MILLS Oil Co., 268 Walton St., Syracuse, N. Y. "Excelsior."

MILWAUKEE Lubricants Co., 112 Huron St., Milwaukee, Wis.

MONAMOBILE—See Monarch Mfg. Co.

MONARCH Mfg. Co., Council Bluffs, Ia. "Monamobile."

MONOGRAM—See New York Lubricating Oil Co.

MOORE Oil Co., York St. & McLean Ave., Cincinnati, O. "Autlubo."

MOTORLIGHT—See Petroleum Coke Co.

MOTORLUBE—See Tygert Co.

MOTOROL—See New York & New Jersey Lubricant Co.

MULLIKEN Oil Co., 200 Friend St., Boston, Mass. "Kosmos."

MURPHYS—See Phoenix Oil Co.

NATIONAL Oil & Supply Co., 180 Frelinghuysen Ave., Newark, N. J. "Viscos."

NATIONAL Refining Co., Rose Bldg., Cleveland, O.

NEW YORK Lubricating Oil Co., New York, N. Y. "Monogram."

NEW York & New Jersey Lubricant Co., 165 Broadway, New York, N. Y. "Motorol."

NOBLE Refining Co., 706 Canal Rd., Cleveland, O.

NOKARBO—See Great Western Oil Co.

NYE, Wm. F., New Bedford, Mass.

OIL City Oil & Grease Co., 365-77 Seneca St., Oil City, Pa. "Pensoil."

OILDAG—See Acheson Oildag Co.

OILZUM—See White & Bagley Co.

OLYMPIA—See Millers Sons Co.

OTTOMO—See Pioneer Mfg. Co.

OZARK—See Tropical Oil Co.

PACKARD 24-30—See Greenslade Oil Co.

PANHARD—See Haws, Geo. A.

PAN-O-LITE—See Miller's Sons.

PARAGON Refining Co., 2935 Front St., Toledo, O. "Petrolene."

PARKER Refining Co., 1307 W. 11th St., Cleveland, O.

PATHFINDER—See Sweet, Charles F.

PATTERSON Lubricating Co., 114 Broad St., Boston, Mass.

PENN Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa. "Primus."

PENSOIL—See Oil City Oil & Grease Co.

PERFECTION—See Crew Levick Co.

PERFECTION—See Wood Co.

PERRY Oil Co., 372 Central Ave., Pawtucket R. I.

PETROLENE—See Paragon Refining Co.

PETROLEUM Coke Co., Edgemont & Venango Sts., Philadelphia, Pa. "Motorlight."

PETROLEUM Products Co., 39th St. & B. & O. R. R., Pittsburg, Pa. "Sound-Proof."

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The dealer who handles Panhard Oil has the satisfaction of winning permanent customers, of seeing his oil sales increase from month to month.

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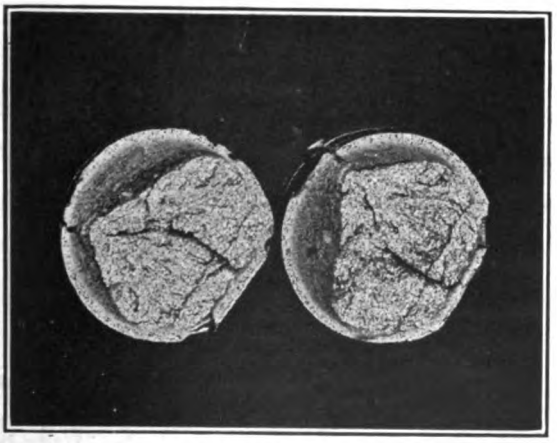

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OILS (Continued)

LUBRICATING OILS (Continued)

PHINNEY Bros. Co., Oil City, Pa. "Quaker State."

PHOENIX Oil Co., 2554 W. Fifth St., Cleveland, O. "Murphys."

PIGOT-SAYRE Co., 71-73 Front St., New York, N. Y. "Aurora."

PIONEER—See Loos & Dilworth.

PIONEER Mfg. Co., Howard Ave. & E. 102d St., Cleveland, O. "Ottomo."

PLATT & Washburn Refining Co., 11 Broadway, New York, N. Y. "Veedol."

POLARINE—See Standard Oil Co. of N. Y.

POWERO—See Buck & Co.

PRIMUS—See Penn Petroleum & Supply Co.

PURE Oil Co., First St., & 13th Ave., S., Minneapolis, Minn. "Puritan."

PURE Oil Co., Fifth & Chestnut Sts., Philadelphia, Pa.

PURITAN—See Pure Oil Co.

PURITAN Oil Co., 1313 W. 70th St., Cleveland, O.

PYCNOLEUM—See Belden & Co.

QUAKER STATE—See Phinney Bros. Co.

RELIABLE—See General Oil Works Co.

RICHARDSON Lubricating Co., Quincy, Ill. "Liberty."

RIE-NIE—See Durkee-Atwood Co.

RIVERSIDE Oil Co., Benedum Trees Bldg., Pittsburg, Pa. "Marathon."

ROBINSON & Son Co., Wm. C., 32 South St., Baltimore, Md. "Autoline."

ROCK—See Magic Bros.

SAWYER Oil Co., Howard B., 62 Long Wharf, Boston, Mass. "Blue Ribbon," "Auto-Use-It."

SEXTON Oil Co., People's Gas Bldg., Chicago, Ill.

SHEPPARD, W. S., 21 Lawrence St., Newark, N. J. "Ideal."

SONNEBORN Sons, L., 262 Pearl St., New York, N. Y. "Amalie."

SOUND-PROOF—See Petroleum Products Co.

SPEARE'S Sons Co., Alden, 140 Sixth St., Boston, Mass.

SPEED-OIL—See Drake Oil Co.

STANDARD Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Polarine."

SULLIVAN Oil Co., 412 Wells St., Chicago, Ill.

SUPERBA—See Curry Bros. Oil Co.

SUPERIOR Oil Co., Century Bldg., Cleveland, O.

SUPREME—See Gulf Refining Co.

SUTHERLAND & Co., P., 232 Milk St., Boston, Mass. "Velvet."

SWAN & Co., Alden S., 135 Front St., New York, N. Y. "Swanoleine."

SWAN & Finch Co., 165 Broadway, New York, N. Y. "Atlas."
(See page 351.)

SWANOLEINE—See Swan & Co.

SWASTIKA—See McLean-Jones Oil & Supply Co.

SWEET, Charles F., 247 State St., Hartford, Conn. "Pathfinder."

TEXACO—See Texas Co.

TEXAS Co., 17 Battery Pl., New York, N. Y. "Texaco."

THERMO—See Haggerty Refining Co.

TIGER—See Tygert Co.

TIOLENE—See Tiona Oil Co.

TIONA Oil Co., 3 William St., Binghamton, N. Y. "Tiolene."

TIONA Refining Co., Madison Ave. & Belt Ry., Indianapolis, Ind.

TROJAN—See Tropical Oil Co.

TROPICAL Oil Co., W., 70th St. & L. S. & M. S. Ry., Cleveland, O. "Ozark," "Trojan."

TYGERT Co., E. A., 126 N. Front St., Philadelphia, Pa. "Motorlube," "Tiger."

UNDERHAY Oil Co., 276 Franklin St., Boston, Mass.

UNION Petroleum Co., 135 S. Second St., Philadelphia, Pa.

VACUUM Oil Co., Rochester, N. Y. "Gargoyle Mobiloils."

VALVOLINE Oil Co., 11 Broadway, New York, N. Y.

VALVONE—See Belden & Co.

VEEDOL—See Platt & Washburn Refining Co.

VELVET—See Sutherland & Co.

VISCO Motor Oil Co., 2104 Superior Viaduct, Cleveland, O.

VISCOMOTOR—See Viscosity Oil Co.

VISCOS—See National Oil & Supply Co.

VISCOSITY Oil Co., 1101-03 W. 37th St., Chicago, Ill. "Viscomotor."

WADHAMS Oil Co., Milwaukee, Wis. "F. V."

WARREN Refining & Chemical Co., Cleveland, O. "Expert."

WAVERLY Oil Works Co., Pittsburg, Pa. "Defiance."
(See page 351.)

WEINBERG & Co., J. H., 128 Maiden Lane, New York, N. Y. "Bully."

WHALE—See Nye, Wm. F.

WHITE & Bagley Co., Worcester, Mass. "Oilsum."
(See page 611.)

WHIZOIL—See Hollingshead Co.

WILBURINE Oil Works, 11 Broadway, New York, N. Y.

WINN, Wm. R., 142 Maiden Lane, New York, N. Y.

WINNE, Howard B., 714 W. Jackson Blvd., Chicago, Ill.

WINSLOW Lubricating Co., 1449-55 Niagara St., Buffalo, N. Y. "Graphinoil."

WOLFS HEAD—See Wolverine Lubricants Co. of N. Y.

WOLVERINE Lubricants Co. of N. Y., 80 Broad St., New York, N. Y. "Wolf's Head."

WONDER WORKER—See Hall-Thompson Co.

WOOD Co., W. A., 372 Atlantic Ave., Boston, Mass. "Perfection."

YOUKIM—See Young & Kimball.

YOUNG, Orlando W., 180 Sherman Ave., Newark, N. J.

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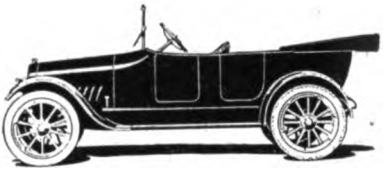

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OILS (Continued)

LUBRICATING OILS (Continued)

YOUNG & Kimball, Frank L., 111 Purchase St., Boston, Mass. "Youkim."

ZURN Co., O. F., 2736-38 N. Broad St., Philadelphia, Pa. "Zurnoil."

ZURNOIL—See Zurn Co.

OPENERS

CURTAIN OPENERS

BLACKMORE—See Dayton Top Improvement Co.

DAYTON Top Improvement Co., Dayton, O. "Blackmore."
(See page 357.)

ERVIEN, Horace, Ogontz, Pa.

HOLCKER-ELBERG Mfg. Co., 16th & McGee Sts., Kansas City, Mo.

JITNEY Curtain Co., 30 N. Ludlow St., Dayton, O.

KELLY & Towers, 1618 Walnut Ave., Cleveland, O. "Towers."

TOWERS—See Kelly & Towers.

ORNAMENTS

RADIATOR ORNAMENTS

ÆTNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ART Metal Works, Newark, N. J.

BALZER Co., Gus, 1777 Broadway, New York, N. Y.

CRAMP & Sons Ship & Engine Building Co., William, Philadelphia, Pa.
(See page 335.)

DUNHAM Co., Thos., 600 Garfield Ave., Aurora, Ill. "Old Doc Yak."

MASCO—See Milwaukee Auto Specialty Co.

MASCOT Novelty Co., 1355 S. Michigan Ave., Chicago, Ill.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

OAKES Co., Dept. A., Indianapolis, Ind.
(See page 223.)

OLD DOC YAK—See Dunham Co.

RILEY-KLOTZ Mfg Co., 17 Mulberry St., Newark, N. J.

ROBBINS & Myers Co., Springfield, O.
(See page 213.)

WELCH Novelty Co., 4540 W. Papin St., St. Louis, Mo.
(See page 761.)

PACKING

ASBESTOS AND FIBROUS PACKING

ADVANCE Packing & Supply Co., 11 N. Franklin St., Chicago, Ill. "Bestalline," "Tenax."

AMBESCO—See American Asbestos Co.

AMERICAN Asbestos Co., Norristown, Pa. "Ambesco."
(See page 619.)

ASBESTOS & Rubber Works of America, 1790 Broadway, New York, N. Y. "Motobestos."
(See page 79.)

ASBESTOS & Rubber Works of New Jersey, Camden, N. J.
(See page opposite Inside Back Cover.)

BESTALLINE—See Advance Packing & Supply Co.

CALIBESTOS—See General Asbestos & Rubber Co.

CRANDALL Packing Co., Palmyra, N. Y.

DEFENDER—See Woven Steel Hose & Rubber Co.

DEMON—See Hart Packing Co.

EAGLE Oil & Supply Co., Boston, Mass.
(See page 827.)

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J. "Motobestos."

ENDURA Mfg. Co., 6317 Eastwick Ave., Philadelphia, Pa.

ESSEX Rubber Co., Trenton, N. J.

FIBRE Finishing Co., 27 State St., Boston, Mass. "Vellumoid."
(See page 703.)

GARLOCK Packing Co., Palmyra, N. Y.

GENERAL Asbestos & Rubber Co., Charleston, S. C. "Calibestos."
(See page 81.)

HART Packing Co., 144 High St., Boston, Mass. "Demon."

J. M.—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J. M."

KEASBEY & Mattison Co., Ambler, Pa.

KNOWLTON Rubber Co., Geo. W., 66 Pearl St., Boston, Mass.

LUXOID—See Thermoid Rubber Co.

MOTOBESTOS—See Asbestos & Rubber Works of America.

MOTOBESTOS—See Empire Rubber & Tire Co.

STAYBESTOS Mfg. Co., 5534 Lena St., (Germantown), Philadelphia, Pa.
(See page 581.)

TENAX—See Advance Packing & Supply Co.

THERMOID Rubber Co., Trenton, N. J. "Luxoid."
(See pages 81 and 289.)

VELLUMOID—See Fibre Finishing Co.

WOVEN Steel Hose & Rubber Co., Trenton, N. J. "Defender."
(See page 829.)

METALLIC PACKING

(See Gaskets, Metallic)

RUBBER PACKING

BOSTON Belting Co., 34 Linden Park St., Boston, Mass.

BOWERS Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

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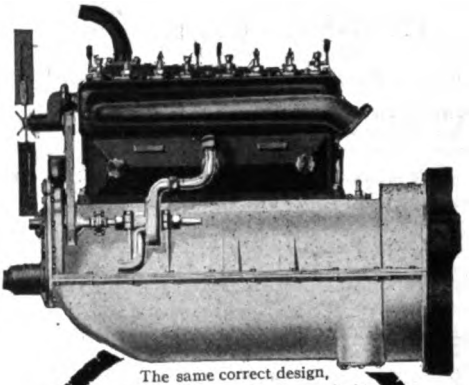

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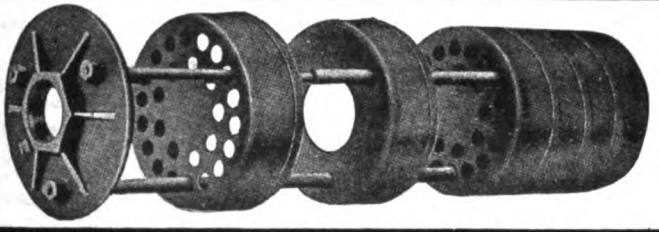

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PACKING (Continued)

RUBBER PACKING (Continued)

CINCINNATI Rubber Mfg. Co., Cincinnati, O. "Royal," "Plymouth," "Sandow." (See page 763.)

CRANDALL Packing Co., Palmyra, N. Y.

EAGLE Oil & Supply Co., Boston, Mass (See page 827.)

GARLOCK Packing Co., Palmyra, N. Y.

HAMILTON Rubber Mfg. Co., Trenton, N. J. (See page 505.)

HART Packing Co., 144 High St., Boston, Mass.

HOME Tire Co., Trenton, N. J.

KNOWLTON Rubber Co., Geo. W., 60 Pearl St., Boston, Mass.

MANHATTAN Rubber Mfg. Co., Passaic, N. J.

NATIONAL India Rubber Co., Bristol, R. I.

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

NEW York Belting & Packing Co., 91 Chambers St., New York, N. Y.

PLYMOUTH—See Cincinnati Rubber Mfg. Co.

QUAKER City Rubber Co., Philadelphia, Pa. (See page 839.)

REPUBLIC Rubber Co., Youngstown, O.

ROYAL—See Cincinnati Rubber Mfg. Co.

SANDOW—See Cincinnati Rubber Mfg. Co.

VOOIHEES Rubber Mfg. Co., Jersey City, N. J.

PADS

LICENSE PADS

(See Numbers, License)

PAINTS

PAINTS AND COLORS

ACME White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

ARSENAL Varnish Co., 25th St. & Fourth Ave., Rock Island, Ill.

AULT & Wiborg Co., New, Seventh & Culvert Sts., Cincinnati, O.

BAY STATE—See Wadsworth, Howland & Co.

BILCHACO—See Billings-Chapin Co.

BILLINGS-CHAPIN Co., Cleveland, O. "Bilchaco."

BUCKEYE Paint & Varnish Co., 15th & Lucas Sts., Toledo, O. (See page 589.)

BULLS-EYE—See Zinsser & Co.

CAPITOL CITY—See Indianapolis Paint & Color Co.

CHICAGO White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill. "King."

CINCINNATI Color Co., Eighth & Evans Sts., Cincinnati, O.

CINCINNATI Varnish Co., 211 South St., Cincinnati, O.

DETROIT White Lead Works, 590-60 Milwaukee Ave., E., Detroit, Mich.

DEVOE & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

DITZLER Color Co., 18 W. Baltimore Ave., Detroit, Mich.

FELTON, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa.

FLINT Varnish & Color Works, Flint, Mich.

FOREST City Paint & Varnish Co., 2324 Lakeside Ave., Cleveland, O.

FRENCH & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

GRAVES Co., N. Z., 22-26 S. Third St., Philadelphia, Pa.

HANLINE Bros., Baltimore, Md.

HEATH & Milligan Mfg. Co., 1235-71 Seward St., Chicago, Ill.

HIGH STANDARD—See Lowe Bros. Co.

HILDRETH Varnish Co., 90 West St., New York, N. Y.

HOFFMAN Paint & Varnish Co., 8 Medford St., Boston, Mass.

INDIANAPOLIS Paint & Color Co., 118 W. Chesapeake St., Indianapolis, Ind. "Capitol City."

JOHNSTON Paint Co., R. F., Pearl & Main Sts., Cincinnati, O.

KEYSTONE Paint & Filler Co., Munsey, Pa.

KING—See Chicago White Lead & Oil Co.

LOWE Bros. Co., Dayton, O. "High Standard."

LUCAS & Co., John, 222-30 Race St., Philadelphia, Pa.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

MOORAMEL—See Moore & Co.

MOORE & Co., Benjamin, 221-32 Front St., Brooklyn, N. Y. "Mooramel."

MOSER Co., Chas., Cincinnati, O.

MOUND City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

MURPHY Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.

NICE, Eugene E., 272-74 S. Second St., Philadelphia, Pa.

PATTERSON-SARGENT Co., E. 38th & St. Clair Sts., Cleveland, O.

PIERCE Co., F. O., 12 W. Broadway, New York, N. Y.

ST. LOUIS Surfacer & Paint Co., Arlington Ave. & Terminal Belt Line, St. Louis, Mo.

SHERWIN-WILLIAMS Co., 190 Canal St., Cleveland, O.

SHRACK & Co., C., 152 N. Fourth St., Philadelphia, Pa.

SMITH & Co., Edward, Sixth St. & West Ave., Long Island City, N. Y.

VALENTINE & Co., 456 Fourth Ave., New York, N. Y.

WADSWORTH, Howland & Co., 34 Washington St., Boston, Mass. "Bay State."

WILHELM Co., A., Third & Bern Sts., Reading, Pa.

WILLEY Co., C. A. (Hunter's Point), New York, N. Y.

ZINSSER & Co., W., 195 William St., New York, N. Y. "Bulls-Eye."

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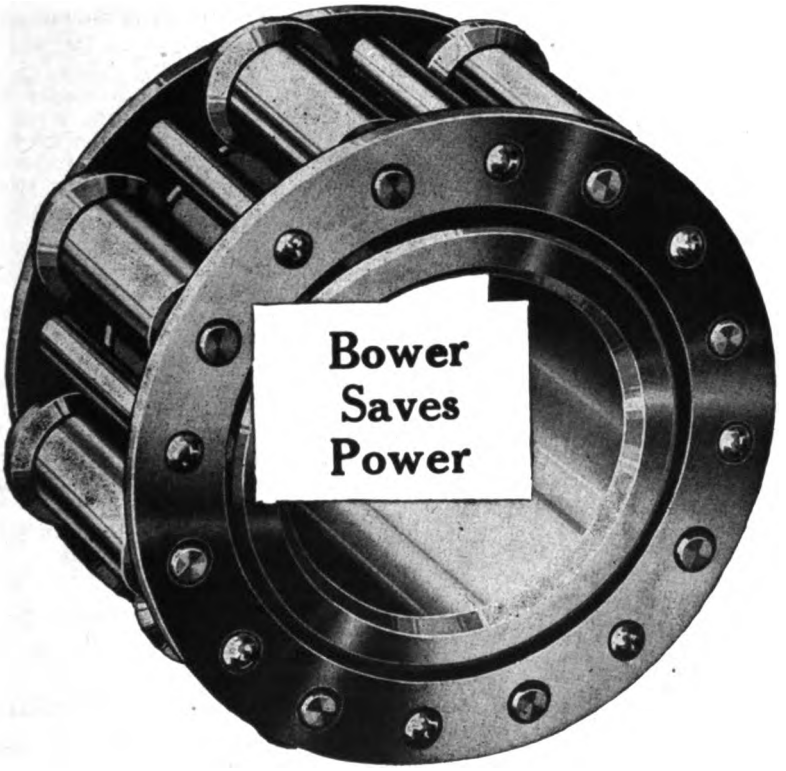

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PAINTS (Continued)

ALUMINUM AND BRONZE PAINTS

ALUSTRIUM—See Devoe & C. T. Raynolds Co.

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

BAER Bros., 438-48 W. 37th St., New York, N. Y.

BILCHACO—See Billings-Chapin Co.

BILLINGS-CHAPIN Co., Cleveland, O. "Bilchaco."

BINSWANGER & Co., B., 329-35 N. Third St., Philadelphia, Pa.

BRONZE Powder Works Co., Elizabeth, N. J. "Ideal," "Vulcan."

CULLEN & Co., F. C., First National Bank Bldg., Chicago, Ill.

DEVOE & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y. "Alustrium."

GENTER Co., J. H., Newburgh, N. Y. "Mirroroide."

GERSTENDORFER Bros., 231 E. 42d St., New York, N. Y. "Sapolin."

IDEAL—See Bronze Powder Works Co.

JEWEL—See Wadsworth-Howland Co.

KEMP Co., W. H., 165 Spring St., New York, N. Y.

MIRROROIDE—See Genter Co.

NUBIAN Paint & Varnish Co., 1856 Le Claire Ave., Chicago, Ill. "Victory."

SAPOLIN—See Gerstendorfer Bros.

SCHLEGEL Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y.

SLIKUP—See Arnold, N. B.

UHLFELDER Co., Leo, 130-32 W. 29th St., New York, N. Y.

VICTORY—See Nubian Paint & Varnish Co.

VULCAN—See Bronze Powder Works Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

ENAMEL PAINTS

ACME White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

AD-EL-ITE—See Adams & Elting Co.

ADAMS & Elting Co., 718-26 Washington Blvd., Chicago, Ill. "Ad-el-ite."

AKRON Varnish Co., Akron, O. "Imperial."

AULT & Wiborg Co., New, Seventh & Culvert Sts., Cincinnati, O.

ARMITAGE & Co., John L., Newark, N. J.

BAY STATE—See Wadsworth, Howland & Co.

BERRY Bros., Detroit, Mich.

BILCHACO—See Billings-Chapin Co.

BILLINGS-CHAPIN Co., Cleveland, O. "Bilchaco."

BIRD & Co., J. A. & W., 88 Pearl St., Boston, Mass. (Importers.) "Ripolin."

BOYER Chemical Laboratory Co., 11 W. Austin Ave., Chicago, Ill.

CHASE, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y.

CLEVELAND Varnish Co., 3111 E. 37th St., Cleveland, O.

COLUMBUS Varnish Co., Columbus, O. "Peerless."
(See page 209.)

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.

DEVOE & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

ESSEX Varnish Co., 92 Vesey St., Nowark, N. J.

FELTON, Sibley & Co., 186-40 N. Fourth St., Philadelphia, Pa.

FLINT Varnish & Color Works, Flint, Mich.

FOREST City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

GLIDDEN Varnish Co., Cleveland, O.
(See page 553.)

HANLINE Bros., Baltimore, Md.

HARDY Paint & Varnish Co., Toledo, O.

IMPERIAL—See Akron Varnish Co.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

MOLLER & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y.

MOUND City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill.

PEERLESS—See Columbus Varnish Co.

PRATT & Lambert, Buffalo, N. Y.

RIPOLIN—See Bird & Co.

ROYAL—See Wilhelm Co.

SHERWIN-WILLIAMS Co., 100 Canal St., Cleveland, O.

SOUTH-WEST Paint & Varnish Co., 2006-12 N. Lamar St., Dallas, Tex.

STANDARD Varnish Works (Elm Park), Port Richmond, N. Y.

VALENTINE & Co., 456 Fourth Ave., New York, N. Y.

WADSWORTH, Howland & Co., 84 Washington St., Boston, Mass. "Bay State."

WILHELM Co., Third & Bern Sts., Reading, Pa. "Royal."

WON Kote Enamel Co., 16 N. Brook St., Geneva, N. Y.

EXHAUST PIPE AND MUFFLER PAINTS

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Century."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Sta-On."
(See page 177.)

BENOIT, Constant A., 12-14 Jerome Ave., Brooklyn, N. Y. "Permatex."

BULGER Varnish Co., William, 3053 E. 37th St., Cleveland, O.

C. O. T.—See Tingley & Co.

CENTURY—See Arnstein, Eugene.

COLUMBUS Varnish Co., Columbus, O. "Peerless."
(See page 209.)

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

Complete Index to Classification appears on Pages 8 to 27.

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With Gasoline at 30¢

Will a Gasoline-Saver Sell?

Will a fish swim? Will a hungry man eat? Will a valve that saves gasoline sell? Why you, and every man in this automobile game knows mighty well that with gasoline going up toward 30c, anything that saves fuel for the motorist will sell like a sporting extra on the World's Series. The greater the saving the faster the sales. All of which means that one of the biggest, livest, sellers of the 1916 season is surely going to be the

BRUGAN ECONOMY VALVE $4

Everything about it is right—it will save from 15 to 35 per cent of the gasoline bill—it will positively give greater speed and greater power to any car—it is well built and simple. The price, $4.00, puts it in the reach of ordinary car owners and its savings must appeal to **every** car owner. The discounts make it a good line for you to handle.

It is adjustable, can be regulated to act most efficiently for each type of motor and for each car operator's individual requirements.

It is of metal—has no washers to overheat and get out of order.

Now we are ready to fill your orders and the sooner you start selling these valves the sooner we will all get our share of the savings they make for your customers.

Write today for our proposition.

How Installed

This valve can be installed in any engine in a few minutes. It should be located in the intake manifold as near the carburetor as possible. It is threaded for ¼" Standard pipe tap.

What It Does

By admitting air to the intake manifold, it improves combustion, and will save from 20 to 35 per cent gasoline or will give 25 to 40 per cent more mileage, will increase the power of the engine, make hill climbing easy, will let the engine pick up faster when accelerating and will cut down the amount of carbon formation in the cylinders.

THE BRUGAN COMPANY

Bangor, Maine

84-1

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PAINTS (Continued)

EXHAUST PIPE AND MUFFLER PAINTS (Continued)

GENTER Co., J. H., Newburgh, N. Y. "Mirroroide."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

MIRROROIDE—See Genter Co.

MOORE & Co., Benjamin, 221-33 Front St., Brooklyn, N. Y.

NORTHWESTERN Chemical Co., Marietta, O.
(See pages 172 and 173.)

PEERLESS—See Columbus Varnish Co.

PERMATEX—See Benoit, Constant A.

RIE-NIE—See Durkee-Atwood Co.

SLIKUP—See Arnold, N. B.

STA-ON—See Atlas Auto Supply Co.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STOWELL, E. R., Oden, Mich.

TINGLEY & Co., Chas. O., Rahway, N. J. "C. O. T."

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

WANG—See Van Tilburg Oil Co.

WONDER WORKER—See Hall-Thompson Co.

WILHELM Co., A., Third & Bern Sts., Reading, Pa. "Royal."

WON Kote Enamel Co., 16 N. Brook St., Geneva, N. Y.

RIM PAINTS

(See also Paints, Aluminum and Bronze; also Paints, Enamel)

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill.
(See page 177.)

BE-BE-CO—See Boston Blacking Co.

BEARDSLEE, J. W., Elmira, N. Y.

BOSTON Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

C. O. T.—See Tingley & Co.

COLUMBUS Varnish Co., Columbus, O. "Peerless."
(See page 209.)

CRUM Mfg. Co., 120 N. Main St., Ottawa, Kans. "Rim-No-Stick."

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

GENTER Co., J. H., Newburgh, N. Y. "Mirroroide."

GRAY Specialty Co., 143 Avon Ave., Newark, N. J.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker," "Rim Kote."
(See page 171.)

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

JEWEL—See Wadsworth-Howland Co.

MIRROROIDE—See Genter Co.

NORTHWESTERN Chemical Co. Marietta, O. "Pioneer."
(See pages 172 and 173.)

PEERLESS—See Columbus Varnish Co.

PIONEER—See Northwestern Chemical Co.

RIE-NIE—See Durkee-Atwood Co.

RIM KOTE—See Hall-Thompson Co.

RIM-NO-STICK—See Crum Mfg. Co.

RIM-SHIM—See Spring Leaf Lubricator Co.

SLIKUP—See Arnold, N. B.

SPRING Leaf Lubricator Co., Ann Arbor, Mich. "Rim-Shim."
(See page 665.)

STANDARD Chemical Co., 292 Stevens Ave., Minneapolis, Minn.

TINGLEY & Co., Chas. O., Rahway, N. J. "C. O. T."

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

RUBBER PAINTS

For refinishing rubber mats and matting and painting tires.)

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Century."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Preservo."
(See page 177.)

AUTO Products Co. of America, 116 N. Commercial St., St. Louis, Mo. "Punchs."

BE-BE-CO.—See Boston Blacking Co.

BOSTON Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

BOYER Chemical Laboratory Co., 11 W. Austin Ave., Chicago, Ill.

BRADLEY & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "Velvet."

CENTURY—See Arnstein, Eugene.

CHIEFTAIN Mfg. Co., Charleston, W. Va. "Tire-Life."

DETROIT White Lead Works, 530-60 Milwaukee Ave. E., Detroit, Mich. "Rogers."

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie."
(See pages 189 to 192.)

FAULTLESS—See Hawkeye Oil Co.

FRENCH & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

JEWEL—See Wadsworth-Howland Co.

NARCO TIRENEW—See National Rubber Co.

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NATIONAL Rubber Co., 4409 Papin St., St. Louis, Mo. "Narco Tirenew."

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill.

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PRESSED STEEL FRAMES

We are specialists of long experience in the manufacture of cold pressed steel frames for pleasure cars and trucks. Our Heavy Duty Truck Frames are specially designed and constructed for severe and unusual service.

DROP FORGINGS

Our Drop Forging Equipment is complete in every detail for the prompt production of superior forgings of exact dimensions and made from selected metal.

Send us your blue prints for estimate.

Driggs-Seabury Ordnance Company

SHARON, PA.

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PAINTS (Continued)

RUBBER PAINTS (Continued)

NORTHWESTERN Chemical Co., Marietta, O. "Tire-Lac."
(See pages 172 and 173.)

PRESERVO—See Atlas Auto Supply Co.

PUNCHS—See Auto Products Co. of America.

RIE-NIE—See Durkee-Atwood Co.

ROGERS—See Detroit White Lead Works.

RUTHERFORD Rubber Co., Rutherford, N. J.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich.

SLIKUP—See Arnold, N. B.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

TILCO Co., 814-20 S. Vandeventer Ave., St. Louis, Mo.

TINGLEY & Co., Chas. O., Rahway, N. J. "Tire Solder."

TIRE-LAC—See Northwestern Chemical Co.

TIRE-LIFE—See Chieftain Mfg. Co.

TIRE SOLDER—See Tingley & Co.

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

VELVET—See Bradley & Vrooman Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WANG—See Van Tilburg Oil Co.

WHIZ—See Hollingshead Co.

WONDER WORKER—See Hall-Thompson Co.

PANELS

CHARGING PANELS AND SWITCHBOARDS

ANDRAE & Sons Co., Julius, Broadway & Michigan Sts., Milwaukee, Wis.

CUTLER Hammer Mfg. Co., 12th St. & St. Paul Ave., Milwaukee, Wis.

CUTTER Co., Geo., South Bend, Ind.

ELECTRIC Products Co., 1067 E. 152d St., Cleveland, O.

ELECTRIC Storage Battery & Mfg. Co., Cincinnati, O.

GENERAL Electric Co., Schenectady, N. Y.

LANG Electric Co., J., 433 N. Lincoln St., Chicago, Ill.

LEONARD Electric Co., Ward, Mt. Vernon, N. Y.

METROPOLITAN Electric Mfg. Co., East Ave. & 14th St., Long Island City, N. Y.

WOOD PANELS

AMERICAN Veneer Co., 1501 Clinton St., Hoboken, N. J.

DANN Bros. & Co., 30-63 Franklin St., New Haven, Conn.

EGGERS Veneer Seating Co., F., Two Rivers, Wis.

EMPIRE Panel & Veneer Co., 940 Seneca St., Buffalo, N. Y.

GRAND Rapids Veneer Works, 800-900 Front St., Grand Rapids, Mich.

MICHIGAN Veneer Co., Alpena, Mich.

NEW Jersey Veneer Co., 258 W. Railway Ave., Paterson, N. J.
(See page 835.)

WISCONSIN Seating Co., New London, Wis.

PANS

DRIP PANS

A-H Mfg. Co., 2076 E. 22d St., Cleveland, O.

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

AUTO Metal Co., 521 Worthington St., Springfield, Mass.
(See page 107.)

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BUSHNELL Tank Works, Bushnell, Ill.

CORNWALL Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.
(See page 739.)

CULLEN-ATKINSON Co., 120 Allyn St., Hartford, Conn. "Hartford."

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

DURLACH, L., 199-201 Wooster St., New York, N. Y.

EVANS Mfg. Co., First Ave. & 21st St., Moline, Ill.

HARTFORD—See Cullen-Atkinson Co.

HESSLER Co., H. E., N. State & Division Sts., Syracuse, N. Y.

KOVEN & Bro., L. O., 154 Ogden St., Jersey City, N. J.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco."
(See page 617.)

ROCHESTER Can Co., 103-09 Hague St., Rochester, N. Y.

SEXTON Can Co., 223 Franklin St., Boston, Mass.

SMYTH Garage Pan Mfg. Co., Patchogue, N. Y.

TODD Mfg. Co., 320-24 Mary Pl., Minneapolis, Minn.

DUST PANS OR UNDER BONNETS

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

DETROIT Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis.
(See page 479.)

GIER Pressed Steel Co., Lansing, Mich.
(See page 787.)

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BERLING MAGNETO

of proved reliability on thousands of motors

Berling Magnetos are delivering ever-at-it service to tens of thousands of individuals, and several nations including the United States of America.

Berling Magneto

Worth More—Does More

FOR 4-CYL. MOTORS

The following types are designed especially for automobiles and motor trucks. These can be safely operated at a speed of 4000 R. P. M. Timing Range—35°

FOR 6-CYL. MOTORS

A-41—Independent high-tension type. For large motors. Particularly adapted to heavy truck service.

B-41—Independent high-tension type. For small motors up to 4″ bore. Particularly adapted to automobile and light truck service.

A-61—Independent high-tension type. For large motors. Particularly adapted to high-powered automobiles.

B-61—Independent high-tension type. For small motors having a bore up to 4″. Particularly adapted to popular "Light Sixes."

ERICSSON MFG. CO., 1124 Military Road, Buffalo, N. Y.

Manufacturers of magnetos for 1, 2, 4, 6, 8, 9-cyl. motors for automobiles, motor trucks, motorcycles, motor boats and aeroplanes.

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PANS (Continued)

DUST PANS OR UNDER BONNETS (Continued)

KEYSTONE Sheet Metal Co., Ambridge, Pa.

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

MOLINE Pressed Steel Co., East Moline, Ill.

MULLINS Co., W. H., 182 Franklin St., Salem, O.

MURRAY Mfg. Co., J. W., 550-60 Clay Ave., Detroit, Mich.

WELDED Steel Barrel Corp., Hart & Charlevoix Sts., Detroit, Mich.

XARDELL Bros Co., 28 Broadway, Utica, N. Y.

PAPER

FRICTION PAPER

(See Frictions, Fibre)

PARTS

MAGNETO AND COIL PARTS

BROWN & Caine, 2112 Michigan Ave., Chicago, Ill.

GUARANTEED Magneto Parts Co., 1765 Broadway, New York, N. Y.

HYGRADE Parts Co., 16 W. 61st St., New York, N. Y.
(See page 487.)

MAGNETO Parts Co., 1790 Broadway, New York, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

ROVTAR Bros., 2250 S. Wood St., Chicago, Ill.

STANDARD Magneto & Parts Co., 1790 Broadway, New York, N. Y.

WEIDENHOFF, Joseph, 1215-17 S. Ashland Ave., Chicago, Ill.

REPAIR PARTS

(For Cars no longer manufactured)

ABBOTT
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

AEROCAR
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

ALCO
Alco Service Co., 158-62 N. 22d St., Philadelphia, Pa.
American Locomotive Co., 30 Church St., New York, N. Y.
Cutting Co., Robt. M., 2635 S. Wabash Ave., Chicago, Ill.
Gorey & Co., Jos. C., 354 W. 50th St., New York, N. Y.
International Motor Co., West End Ave. & 64th St., New York, N. Y.
Rand & Chandler, 526 S. Floer St., Los Angeles, Cal.

AMERICAN
American Motor Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Longaker Co., V., 448-50 N. Capitol Ave., Indianapolis, Ind.

AMERICAN MORS
St. Louis Car Co., 8000 N. Broadway, St. Louis, Mo.

AMPLEX
Amplex Auto & Machine Works, Mishawaka, Ind.

ANCHOR
Anchor Buggy Co., Cincinnati, Ohio.
Anchor Motor Car Co., St. Louis, Mo.

ANHUT
Auto Parts Mfg. Co., Detroit, Mich.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

ARDSLEY
Ardsley Motor Car Co., Yonkers, N. Y.

ATLAS
Atlas Motor Car Co., Springfield, Mass.
Auto Parts & Repair Co., 101 Liberty St., Springfield, Mass.
Gorey & Co., Jos. C., 354 W. 50th St., New York, N. Y.

AUTOCAR
Autocar Co., Ardmore, Pa.

BADGER
Schultz & Harder, Columbus, Wis.

BARNES
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

BERGDOLL
American Motor Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Bergdoll Motor Co., Philadelphia, Pa.
Gorey & Co., Jos. C., 354 W. 50th St., New York, N. Y.

BERKSHIRE
Belcher Engineering Co., 43 Ames St., Cambridge, Mass.
Berkshire Motor Co., Pittsfield, Mass.

BLACK CROW
Crow Motor Car Co., Elkhart, Ind.

BLOMSTROM
Blomstrom Motor Car Co., Detroit, Mich.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

BROWNIEKAR
Hinsdale Electric Supply Co., Hinsdale, Ill.

BRUSH
Brush Runabout Co., Detroit, Mich.
Davidson Repair Shop, 227 W. 64th St., New York, N. Y.
Standard Motor Parts Co., New Castle, Ind.

CALIFORNIA
California Auto Co., Los Angeles, Cal.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CAR-NATION
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Car-Nation Motor Car Co., Detroit, Mich.
K. C. Auto Parts Co., 1827 McGee St., Kansas City, Mo.

CARTERCAR
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CENTURY
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

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INDIANA 1, 2, 3½ and 5-ton

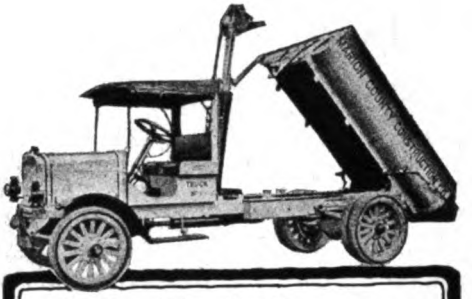
Famous Worm-Drive line of Chainless, Silent Trucks

have fully proven themselves reliable and very efficient in working for America's leading industries. Sold on "Pay-Their-Own-Way" Installment Plan.

Live Agents—here is a money making opportunity, means unparalleled sales. Thousands of dollars made by INDIANA dealers this year. Wire for territory.

Indiana Truck Company
454 Indiana Ave.

Founded 1898 — **Marion, Ind., U.S.A.**



The B. A. Gramm Truck

5-6 Ton 3½ Ton 2½ Ton 1½ Ton 1 Ton

Our prices cover the B. A. GRAMM chassis complete with tires, tools, jack, horn, lamps and Hub-odometer and are quoted F.O.B. Lima, Ohio.

The market knows no more powerful line of trucks—judged by their work, ability or by their sales value.

Suggestions and recommendations as to body equipment furnished upon request.

Our quotations will be found consistent with the B. A. GRAMM policy—
"Give Value."

The Gramm-Bernstein Company
Lima, Ohio, U. S. A.

Regardless of comparative tonnage or capacity, this truck shows itself the greatest dollar for dollar motor truck value on the American market.

CHASE MODEL A CHASSIS $1650

CAB, SEAT, CURTAINS, AND PAINTING INCLUDED

This big, heavy duty truck has a record of performance that creates an opportunity for owners and dealers alike. Write at once for detailed specifications and list of 6,000 users in every line of business.

CHASE MOTOR TRUCK COMPANY
116 West St., Syracuse, N. Y.

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PARTS (Continued)

REPAIR PARTS (Continued)

CINO
Haberer & Co., Cincinnati, O.
(See page 585.)

CLARK
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Meteor Motor Co., Shelbyville, Ind.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CLARK-CARTER
Cutting Motor Car Co., Jackson, Mich.
Erbes, L. C., Waterloo, Iowa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CLEVELAND
Western Motor Car Co., 6604 Euclid Ave., Cleveland, O.

COATES-GOSHEN
Coates, J. S., Goshen, N. Y.

COLBURN
Colburn Automobile Co., Denver, Colo.
Erickson, Jos., 12 E. Eighth Ave., Denver, Colo.

COLUMBIA
Columbia Auto Repair Co., Hartford, Conn.
Standard Motor Parts Co., Newcastle, Ind.

COLUMBUS ELECTRIC
New Columbus Buggy Co., Columbus, O.

CORBIN
Corbin Motor Vehicle Corp., New Britain, Conn.

COURIER-CLERMONT
Standard Motor Parts Co., Newcastle, Ind.

CRESCENT
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CRICKET
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CROW
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

CROXTON-KEETON
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
K. C. Auto Parts Co., 1827 McKee St., Kansas City, Mo.

CUTTING
Erbes, S. C., St. Paul, Minn.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

DART
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

DAYTON
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

DEAL
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.

DEARBORN-DETROIT
Huron Motor Car Co., Dearborn, Mich.

DEERE-CLARK
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.

DE LUXE
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

DEMOT
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

DE TAMBLE
American Motor Parts Co., 402 N. Capitol Ave., Indianapolis, Ind.
De Tamble Motors Co., Anderson, Ind.
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

DRAGON
Philadelphia Machine Works, 61-71 Laurel St., Philadelphia, Pa.

ECLIPSE
Krueger Motor Car Co., Milwaukee, Wis.
Toepfer's Sons, Frank, 45 National Ave., Milwaukee, Wis.

EDWARDS
Edwards Motor Car Co., Long Island City, N. Y.

ELECTRIC VEHICLE
Maxwell Briscoe Motor Co., Long Island City, N. Y.

ELMORE
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

EVERETT
Holt-Chandler, Long Island City, N. Y.
Maxwell Motor Co., New Castle, Ind.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

EWING
Ewing, L. E., Leader Bldg., Cleveland, O.
Gorey & Co., Jos. C., 354 W. 50th St., New York, N. Y.

F. A. L.
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
K. C. Motor Parts Co., 1827 McGee St., Kansas City, Mo.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

FINDLAY
Ewing, L. E., Leader Bldg., Cleveland, O.

FIRESTONE COLUMBUS
New Columbus Buggy Co., Columbus, O.

FLANDERS
Studebaker Corp., Detroit, Mich.

FULLER
Jackson Auto Co., Jackson, Mich.

GAETH
Gaeth Motor Car Co., 2103 Lorain Ave., Cleveland, O.

GLEASON
Bauer Machine Works Co., 109 W. 18th St., Kansas City, Mo.

GRABOWSKY
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

GREAT SMITH
Bauer Machine Works Co., 109 W. 18th St., Kansas City, Mo.
Smith Automobile Co., Topeka, Kan.

GROUT
Kirkpatrick, A. F., Orange, Mass.

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PREMIER

—the new Lynite Six with magnetic gear shift — 125½ inch wheel base, roomy seven passenger—$1685 f.o.b. factory—a super-de-luxe equipage with unusual refinements and advantages.

PREMIER MOTOR CORPORATION

Indianapolis, U. S. A.

PAIGE

"The Standard of Value and Quality"

With the "Six-38" at $1050 and the "Six-46" at $1295, Paige dealers will occupy an impregnable position. They need fear no competition. They can sell any prospect.

Does the entire motor car field offer ***you*** a better, a surer business opportunity? Write for full particulars.

Paige-Detroit Motor Car Company
DETROIT, MICHIGAN

Garford

Motor Trucks

Truck Efficiency For Every Purpose

The unusual completeness of the Garford line, consisting of trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity, assuring a truck exactly suited to any transfer or delivery requirement, makes it an unusual opportunity for the Distributor of Motor Trucks. Some territory open. Write for Distributor's proposition.

The Garford Motor Truck Co.
Lima Ohio

LOZIER

"Choice of Men Who Know"

ARISTOCRATIC SIX - $2775
FAMOUS FOUR - - $1595
LIGHT SIX 50 H. P. $1875

Quality cars at prices that fit almost any purse—comprising a complete line for dealers.

We can take on a few additional live dealers. Write for our proposition.

LOZIER MOTOR CO.
DETROIT, MICHIGAN

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PARTS (Continued)

REPAIR PARTS (Continued)

HALLADAY
Barley Mfg. Co., Streator, Ill.
Streator Motor Car Co., Streator, Ill.

HART-KRAFT
Petrie & Morganthall, Greencastle, Pa.

HAVERS
M & M Co., 515 Huron Rd., Cleveland, O.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

HENDERSON
American Motors Parts Co., 402 N. Capitol Ave., Indianapolis, Ind.
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

HENRY
Muskegon Auto Co., Muskegon, Mich.

HERRESHOFF
American Motors Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Gorey & Co., Jos. C., 354 W. 50th St., New York, N. Y.
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

HEWITT
International Motor Co., 64th St. & West End Ave., New York, N. Y.

HOLSMAN
Mercury Mfg. Co., 4118 S. Halsted St., Chicago, Ill.

HOUPT
New Departure Mfg. Co., Bristol, Conn. (See page 101.)

INTER-STATE
Inter-State Automobile Co., Muncie, Ind.

JOHNSON
Johnson Service Co., Milwaukee, Wis.

KEETON
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Car-Nation Motor Co., Detroit, Mich.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

KELSEY
Kelsey Motor Co., Hartford, Conn.

KOMET
Keith Bros., Elkhart, Ind.

KRIT
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Krit Motor Car Co., E. Grand Blvd., Detroit, Mich.
Motor Corporation, rear 1309 Race St., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

LEWIS
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.

LIBERTY
Belmont Automobile Mfg. Co., New Haven, Conn.

LION
American Motors Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
K. C. Auto Parts Co., 1827 McGee St., Kansas City, Mo.
Lion Motor Parts Co., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

LITTLE FOUR
Chevrolet Motor Co., 1651 Broadway, New York, N. Y.

LOGAN
Gramm Motor Truck Co., Lima, O.

LOZIER
Philadelphia Machine Works, 61-71 Laurel St., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

MARATHON
Marathon Service Co., 14th & Clinton Sts., Nashville, Tenn.

MARION
American Motors Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Elyria Belting & Machinery Co., Elyria, O.
K. C. Auto Parts Co., 1827 McGee St., Kansas City, Mo.
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Longaker Co., V. A., 448-50 N. Capitol Ave., Indianapolis, Ind.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

MARQUETTE
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

MARVEL
Star Truck Co., Detroit, Mich.

MATHESON
Matheson, Frank F., Wilkes-Barre, Pa.

MAXWELL
Maxwell Motor Sales Co., New Castle, Ind.

MICHIGAN
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
K. C. Auto Parts Co., 1827 McGee St., Kansas City, Mo.
Michigan Motor Car Parts Co., Kalamazoo, Mich.
Philadelphia Machine Works, 61-71 Laurel St., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

MIDDLEBY
Goldberg, H., 1420 S. 8th St., Philadelphia, Pa.
Levengood, A. J., 153 N. Fourth St., Reading, Pa.

MIDLAND
American Motors Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
K. C. Auto Parts Co., 1827 McGee St., Kansas City, Mo.
Midland Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

MIER
Mier Carriage & Buggy Co., Ligonier, Ind.

MILWAUKEE
Erbes, L. C., Waterloo, Iowa.

MORA
Philadelphia Machine Works, 61-71 Laurel St., Philadelphia, Pa.

NORTHERN
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

NYBERG
American Motors Parts Co., 430 N. Capitol Ave., Indianapolis, Ind.
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Longaker Co., V. A., 448-50 N. Capitol Ave., Indianapolis, Ind.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

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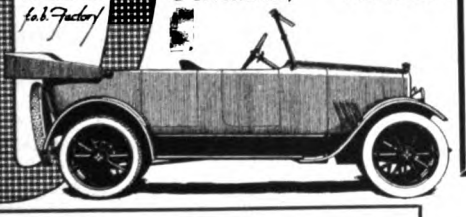

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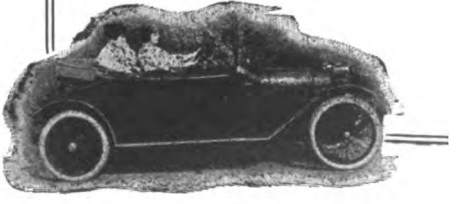

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PARTS (Continued)

REPAIR PARTS (Continued)

OHIO
Northern Auto Parts & Sales Co., 217 E. Eighth St., Cincinnati, O.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

OLIVER
Oliver Motor Truck Co., Detroit, Mich.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

OMAHA
Motor Car Sales Co., 1818 Farnam St., Omaha, Nebr.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

ORIENT
Metz Co., Main & Gore Sts., Waltham, Mass.

ORSON
Drenco Machine Co., Broadway & 50th St., New York, N. Y.

OTTO-MOBILE
Holly Motor Co., Mount Holly, N. J.
Otto-Mobile Co., Philadelphia, Pa.

OWEN
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

PALMER-SINGER
Drenco Machine Co., Broadway & 50th St., New York, N. Y.
Singer Motor Co., 630 Jackson Ave., Long Island City, N. Y.

PANHARD
Babel, L., 371 E. 29th St., Chicago, Ill.

PARRY
Motor Car Mfg. Co., Indianapolis, Ind.
Pathfinder Co., Indianapolis, Ind.

PENNSYLVANIA
Central Auto Supply Co., Philadelphia, Pa.
Dougherty, 1845 N. 19th St., Philadelphia, Pa.

PETREL
Filer & Stowell Co., Milwaukee, Wis.

PIERCE-RACINE
Pierce Motor Co., Racine, Wis.

PIONEER
Pioneer Car Mfg. Co., Oklahoma City, Okla.

PITTSBURGH SIX
Chester Engineering Co., Chester, Pa.

POPE-HARTFORD
Boulevard Motor Co., Cambridge, Mass.
Hartford Motor Car Co., 410 Main St., Hartford, Conn.
Rosenfield, J., 521 Sixth St., So., Boston, Mass.

POPE-TOLEDO
Auto Salvage Parts Co., 1436 Wabash Ave., Chicago, Ill.

PUNGS-FINCH
Pungs-Finch Auto & Gas Engineering Co., Detroit, Mich.

QUEEN
Auto Parts Mfg. Co., 737 W. Jackson Blvd., Chicago, Ill.
Blomstrom Motor Car Co., Detroit, Mich.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

R. C. H.
Jahns, W. H., 908 W. Pico St., Los Angeles, Cal.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

RANDOLPH
DeKalb Wagon Co., DeKalb, Ill.

RAINIER
Gramm Motor Truck Co., Lima, O.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

READING
Goldberg, H., 1420 S. Eighth St., Reading, Pa.

RELIABLE
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

RELIABLE-DAYTON
Auto Parts Co., 737 W. Jackson Blvd., Chicago, Ill.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

REPUBLIC
Republic Motor Car Co., Youngstown, O.

RICKETTS
Ricketts Automobile Works, 1997 W. Grand Blvd., Detroit, Mich.

RIDER-LEWIS
Auto Parts Mfg. Co., Detroit, Mich.
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Longaker Co., V. A., 448-50 N. Capitol Ave., Indianapolis, Ind.
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

SANDUSKY
Dauch Mfg. Co., Sandusky, O.

SAMPSON
Standard Motor Parts Co., New Castle, Ind.

SCHACHT
General Auto Repairs Co., 908-12 Race St., Cincinnati, O.

S. G. V.
S. G. V. Co., 500 Central Ave., Newark, N. J.

SOUTHERN
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

SPEEDWELL
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

GREEN Engineering Co., Dayton, O.
(See page 869.)

SPRINGFIELD
Haas Elec. & Mfg. Co., R., Springfield, Ill.

STANDARD SIX
St. Louis Car Co., 8000 N. Broadway, St. Louis, Mo.

STAR
Mier Carriage & Buggy Co., Ligonier, Ind.

STERLING
Crow Motor Car Co., Elkhart, Ind.
Keith Bros., Elkhart, Ind.

STEVENS-DURYEA
Walk Hill Garage, 726 Walk Hill St., Mattapan, Mass.

STODDARD-DAYTON
Dayton Automobile Repairing Co., 355 W. 52nd St., New York, N. Y.
Standard Motor Parts Co., New Castle, Ind.

THOMAS
Automobile Cons. Co., 2637 Cottage Grove Ave., Chicago, Ill.
Jahns, W. H., 908 W. Pico St., Los Angeles, Cal.
Rosenfield, J., 521 Sixth St., So. Boston, Mass.
Thomas Motor Car Co., E. R., Buffalo, N. Y.

TINCHER
Chicago Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

TOURIST
Burt Motor Car Co., W. J., Los Angeles, Cal.

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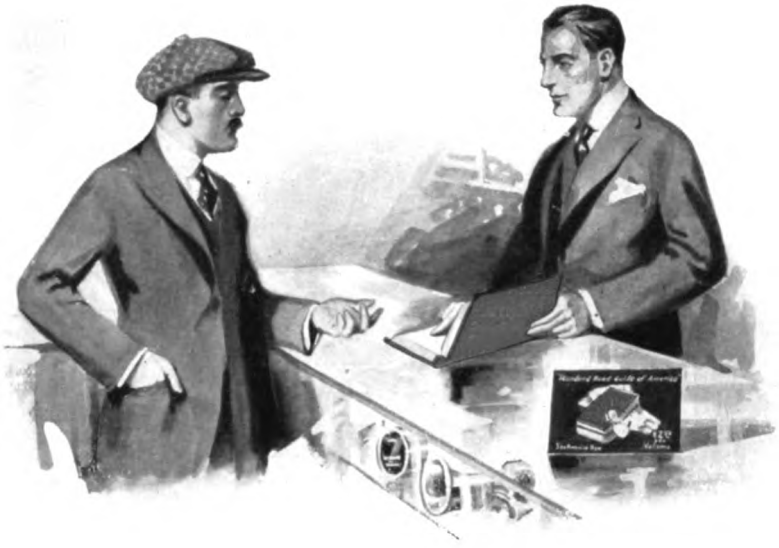

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Alling Rubber Co.....Hartford, Conn.
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Binghamton, N. Y.
Consumers' Auto Supply Co.
Pittsburgh, Pa.
Gaul, Derr & Shearer Co.
Philadelphia, Pa.
Greensboro Mot. Car Co.
Greensboro, N. C.
Iver Johnson Sptg. Goods Co.
Boston, Mass
Martin-Evans Co.....Brooklyn, N. Y
Chas. E. Miller Co.....New York City
Motor Car Equipment Co., Boston, Mass.
Motor Car Equipment Co., New York City
Nat'l Electrical Supply Co.
Washington, D. C.
N. Y. Sptg. Goods Co...New York City
Portsmouth Motor Mart
Portsmouth, N. H.
Post & Lester Co.....Hartford, Conn.
States Garage Co...Atlantic City, N. J.
Times Square Auto Co..New York City
U. S. Rubber Co.....Syracuse, N. Y
Jos. Woodwell Co.....Pittsburgh, Pa.

Andrew Cowan & Co....Louisville, Ky.
Automobile Equipment Co.
Detroit, Mich
Beckley-Ralston Co.....Chicago, Ill
Beck & Corbitt Iron Co..St Louis, Mo.
Chicago Automobile Supply Co
Chicago, Ill.
Coughlin & Davis .....Cincinnati, Ohio
Electric Appliance Co.....Chicago, Ill.
General Sales Co.....Detroit, Mich
The Gibson Co.....Indianapolis, Ind.
Herring Motor Co....Des Moines, Iowa
Kansas City Automobile Supply Co.
Kansas City, Mo.
M. & M Co.....Cleveland, Ohio
Motor Car Supply Co.....Chicago, Ill.
Powell Supply Co.....Omaha, Neb.
Quinn & McGill Motor Supply Co.
Denver, Col.
Reed Motor Supply Co..St. Paul, Minn.
Union Supply Co.....Toledo, Ohio
Wm. Warnock Co.. ..Sioux City, Iowa
Western Auto Supply Co.
Kansas City, Mo.
Western Motor Supply Co.
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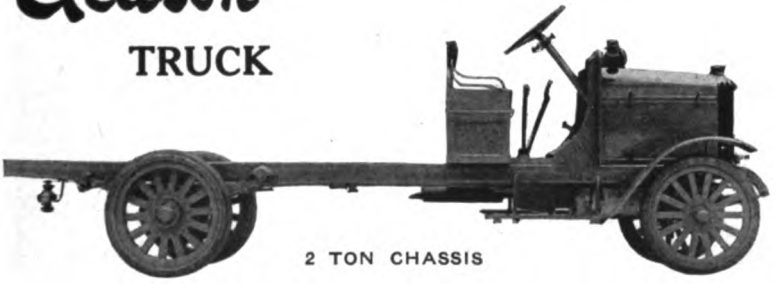

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REPAIR PARTS (Continued)

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VAN ROADSTER
Erbes, L. C., Waterloo, Iowa.

WAHL
Bailey Mfg. Co., Streator, Ill.

WALTHAM-ORIENT
Metz Co., Main & Gore Sts., Waltham, Mass.

WARREN-DETROIT
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

WAYNE
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

WELCH-PONTIAC
Puritan Machine Co., 411-17 Lafayette Blvd., Detroit, Mich.

WHITING
Chevrolet Motor Co., Flint, Mich.

SPEEDOMETER REPAIR PARTS

STEWART, F. W., 1402-06 Michigan Ave., Chicago, Ill.
(See page 375.)

PASTE

HAND PASTE

(See Soaps, Hand)

SOLDERING PASTE

(See Flux, Soldering)

TRIMMERS PASTE

BUCKEYE Paste Co., 270 S. Wall St., Columbus, O.

PATCHES

TIRE REPAIR PATCHES

(See also Shoes, Inner Tire; also Sleeves, Tire Repair)

ALDING—See Alsten & Goulding Co.

ALLIANCE Rubber Co., Alliance, O.
(See page 845.)

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

AMERICAN Rubber & Tire Co., 70-78 Beach St., Akron, O. "Cling-Tite."

BRAENDER Rubber & Tire Co., Rutherford, N. J. "Jiffy."
(See page 551.)

BRICTSON Mfg. Co., Brookings, S. Dak.

BULL DOG—See Polson Rubber Co.

CENTURY—See Nemo Chemical & Specialty Mfg. Co.

CHEMI Co., 629 E. Main St., Richmond, Va. "Se-Ment-All."

CLING-TITE—See American Rubber & Tire Co.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
(See page 685.)

DOUBLE Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.

EASTERN Rubber Co., 1529 Ridge Ave., Philadelphia, Pa. "Magic."

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ENDURANCE Tire & Rubber Co., New Brunswick, N. J.

EVERLASTING—See Legnard & Co.

EVERLOC—See Wood Co.

EXCEL Rubber Co., Akron, O.

FALLS Rubber Co., Cuyahoga Falls, O.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

FIRESTONE Tire & Rubber Co., Akron, O

FORD & Lyon, Fitchburg, Mass.
(See page 685.)

GENERAL Tire & Rubber Co., Akron, O.
(See page 531.)

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GRAY Specialty Co., 148 Avon Ave., Newark, N. J. "Selbst-Gemacht."

HALL-THOMPSON Co., Hartford, Conn. "Vulco-Visco."
(See page 171.)

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind.
(See page 523.)

JACKSON-ENO Rubber Co., 1010 S. Main St., Los Angeles, Cal. "Peerless."

JIFFY—See Braender Rubber & Tire Co.

JIFFY—See Johnstown Rubber Co.

JIFFY Specialty Co., McKeesport, Pa.

JOHNSTOWN Rubber Co., Johnstown, Pa. "Jiffy."

KEYSTONE Rubber Mfg. Co., Erie, Pa.
(See page 521.)

LEE Tire & Rubber Co., Conshohocken, Pa.

LEGNARD & Co., A. B., Waukegan, Ill. "Everlasting."

LOCKTITE Patch Co., 1026 Bellevue Ave., Duluth, Minn.

M. & M. Mfg. Co., Miami St., Akron, O. "Stick-Tite."

MAGIC—See Eastern Rubber Co.

MATTSON Rubber Co., Lodi, N. J.
(See page 827.)

MANHATTAN Rubber Mfg. Co., Passaic, N. J.

MICHELIN Tire Co., Milltown, N. J.
(See Inside Back Cover.)

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

MILLER Rubber Co., Akron, O.

MISSOURI Rubber Mfg. Co., 936 N. Kingshighway, St. Louis, Mo.

MOTOR Supplies Mfg. Co., 21 Fifth St., N. E., Minneapolis, Minn. ""Perma-Tite."

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill. "Century."

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F. W. STEWART

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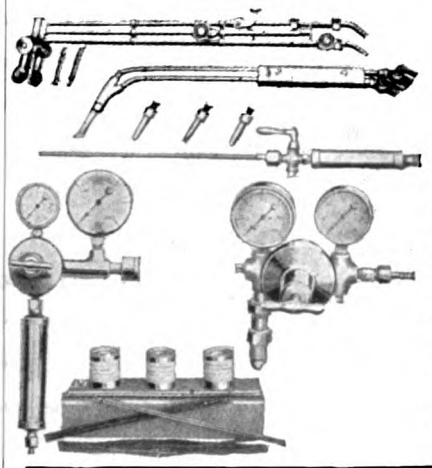

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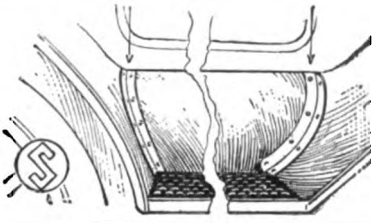

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PATCHES (Continued)

TIRE REPAIR PATCHES (Continued)

PEERLESS—See Jackson-Eno Rubber Co.

PEERLESS Cement Co., 39 Viaduct, Akron, O.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

PERMA-TITE—See Motor Supplies Mfg. Co.

POLSON Rubber Co., 331 Southwest Blvd., Kansas City, Mo. "Bull Dog."

PORTAGE Rubber Co., Barberton, O.

QUAKER City Rubber Co., Philadelphia, Pa.
(See page 839.)

QUICK-TITE Patch Co., 20 Market St., Amsterdam, N. Y.

S-V—See Williams Mfg. Co.

SE-MENT-ALL—See Chemi Co.

SECURITY Co., 56 Terminal Way, Pittsburg, Pa.

SELBST-GEMACHT—See Gray Specialty Co.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich.

STICK-TITE—See M. & M. Mfg. Co.

STITCH-IN-TIME—See Wood Co.

TINGLEY & Co., Chas. O., Rahway, N. J.

TOLEDO-FINDLAY Tire & Rubber Co., Western Ave., Findlay, O.

TWENTIETH Century Tire Protector Co., Midlothian, Tex.

TYER Rubber Co., Andover, Mass. "Tyrian."

TYRIAN—See Tyer Rubber Co.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

VITALIC—See Continental Rubber Works.

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

VULCANIZED Products Co., Muskegon, Mich.

VULCO-VISCO—See Hall-Thompson Co.

VULTITE Rubber Co., Bridgeport, Conn.
(See page 797.)

WILLIAMS Mfg. Co., 18th & Carman Sts., Camden, N. J. "S-V."

WOOD Co., W. C., 40 N. Tenth St., Minneapolis, Minn. "Everloc," "Stitch-in-Time."
(See page 471.)

YATMAN Rubber Co., 267-69 Mt. Pleasant Ave., Newark, N. J.

PATTERNS

AUTOMOBILE PATTERN MAKERS

ACME Pattern Co., Grant & Letchworth Sts., Buffalo, N. Y.

ACME Pattern Works, 9 Woodward Ave., Detroit, Mich.

BUFFALO Pattern Works, 13-17 Perry St., Buffalo, N. Y.

COLTON Co., Arthur, Jefferson & Chene Sts., Detroit, Mich.

EASTERN Pattern Works, 28-32 Wight St., Detroit, Mich.

HARTFORD Pattern & Model Co., 120 Allyn St., Hartford, Conn.

JACOBSEN & Co., K. F., 1218 Washington Ave., Racine, Wis.

JURACK Pattern Works, Chas., 199-201 Oregon St., Milwaukee, Wis.

MICHIGAN Pattern Works, 1085-89 Jefferson Ave., E., Detroit, Mich.

NESOM & Wenz Co., 22 W. South St., Indianapolis, Ind.

NOBACH Pattern Works, W. J., 522-24 Jackson Blvd., Chicago, Ill.

PEERLESS Pattern Works, 1133 Main St., Buffalo, N. Y.

PEERLESS Pattern Works, 405 E. Madison St., South Bend, Ind.

PHILLIPS, W. H., Exposition Bldg., Cambridge, Mass.

REMMERS Pattern Co., 811-13 N. Ninth St., St. Louis, Mo.

STANDARD Pattern Works, 144-46 Fort St. E., Detroit, Mich.

STANDARD Pattern Works Co., 5337 St. Clair Ave., Cleveland, O.

WALLACE, John D., 527 W. Van Buren St., Chicago, Ill.

WEST & Dodge, 384 Atlantic Ave., Boston, Mass.

WHITELEY Bros., 82-84 Church St., New York, N. Y.

PEDALS

HORN AND CUT OUT PEDALS

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BARCO Brass & Joint Co., 212-22 W. Illinois St., Chicago, Ill.

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

EBERHARD Mfg. Co., 2784 Tennyson Rd., Cleveland, O.

GABRIEL Mfg. Co., 1407 40th St., N. E., Cleveland, O.

GEMCO Mfg .Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GRAY-HAWLEY Mfg. Co., 987-43 Jefferson Ave., Detroit, Mich.

MEDINA Stamping & Machine Co., 217 Main St., Medina, N. Y.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MILWAUKEE Auto Engine & Supply Co., 29th St. & Mieneke Ave., Milwaukee, Wis.

NATIONAL Jack & Mfg. Co., 120-24 S. Clinton St., Chicago, Ill.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

STRYKER, C. W., 240 Shonnard St., Syracuse, N. Y.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
(See page 817.)

Complete Index to Classification appears on Pages 8 to 27.

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Signal Worm Drive Motor Trucks

Timken Axles
Continental Motor
Brown-Lipe Transmission

1 Ton	$1,550.00
1½ Ton	1,800.00
2 Ton	2,100.00
3½ Ton	3,000.00
5 Ton	4,000.00

Signal Motor Truck Co.
DETROIT, MICH.

The Reasons Why Truck Buyers Buy Again When They Select An

Are the Reasons Which Recommend This Truck to Users as Well as to Dealers.

Ask us those reasons and prices

Atterbury Motor Car Co.
Buffalo, N. Y.

CHANDLER SIX
$1295

Chandler sales for the year 1916 are setting a *new big record* for high grade sixes.

In the midst of extravagant claims for new and uncertain theories, the Chandler Motor, refined and perfected through three years of development, remains free from any hint of experimentation. And Chandler bodies are the most beautiful of the year.

Seven-Passenger Touring Car	$1295
Four-Passenger Roadster	$1295
Convertible Sedan	$1895
Convertible Coupé	$1895
Limousine	$2595

(F. O. B. Cleveland)

CHANDLER MOTOR CAR COMPANY
CLEVELAND, OHIO

ARGO

The Motor-Car for the Millions

A better car at a lower price. Your investigation will prove it.

Touring Car	Roadster
$455	$405

Electric starting and lighting, $60 extra.

A popular car—and we can make prompt deliveries.

Write, wire or come to the factory

Argo Motor Company, Inc.
132 Park Ave., Jackson, Mich.

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PEDALS (Continued)

HORN AND CUT OUT PEDALS (Continued)

WHITEHOUSE-LE COMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

RATCHET PEDALS

(For locking Brakes, etc.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

SPECIAL ACCELERATOR PEDALS

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HACKNEY—See Roller Bearing Foot Pedal Co.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. "Imperial-Wixon."
(See page 869.)

IMPERIAL-WIXON — See Imperial Brass Mfg. Co.

ROLLER Bearing Foot Pedal Co., Hackney Bldg., St. Paul, Minn. "Hackney."

PINIONS

METAL AND RAWHIDE PINIONS

(See Gears)

PINS

COTTER PINS

AKWIGOCO—See Ohio Wire Goods Co.

AMERICAN Chain Co., Bridgeport, Conn. "Campbell."
(See page 157.)

AMERICAN Cotter Pin Co., Park Bldg., Pittsburgh, Pa. "Kelkotters."

BROOKS & Sons, M. S., Chester, Conn.

CAMPBELL—See American Chain Co.

COBB & Drew, Plymouth, Mass.

HINDLEY Mfg. Co., John St., Valley Falls, R. I.

HUBBARD Spring Mfg. Co., Pontiac, Mich.
(See page 679.)

JENCKES Mfg. Co., E., 28 Union St., Worcester, Mass.

KELKOTTERS—See American Cotter Pin Co.

McWHORTER Mfg. Co., Riverton, N. J.

NATIONAL Screw & Tack Co., Cleveland, O.
(See page 119.)

OHIO Wire Goods Co., 1071 Bank St., Akron, O. "Akwigoco."

SACO—See Smith & Co.

SMITH & Co., F. P., 114 Railroad Ave., Sharon Hill, Pa. "Saco."

WHITAKER Mfg. Co., Chicago, Ill.
(See page 765.)

WHITMAN & Barnes Mfg. Co., Akron, O.

WIRE Goods Co., 28 Union St., Worcester Mass.

ESCUTCHEON PINS

AMERICAN Steel & Wire Co., Chicago, Ill.
(See page 575.)

ATLAS Tack Co., Fairhaven, Mass.

BLAKE & Johnson Co., Waterbury, Conn.

CORBIN Screw Corp., New Britain, Conn.
(See page 831.)

EAGLE—See Plume & Atwood Mfg. Co.

HASSALL, John, Clay & Oakland Sts., Brooklyn, N. Y.

MILWAUKEE Tack Co., 27th Ave. & Wahl St., Milwaukee, Wis.

PLUME & Atwood Mfg. Co., 470 Bank St., Waterbury, Conn. "Eagle."

STAR—See Turner & Seymour Mfg. Co.

TURNER & Seymour Mfg. Co., Torrington, Conn. "Star."

WATERBURY Mfg. Co., Waterbury, Conn.

WIRE Goods Co., 28 Union St., Worcester, Mass.

PISTON PINS

ASHLEY Machine Works, 724 University Ave., Rochester, N. Y.
(See page 323.)

CLIMAX Machinery Co., 143-63 E. Morris St., Indianapolis, Ind.

GREEN Engineering Co., Dayton, O.
(See page 869.)

HOUPERT Machine Co., 349 W. 52d St., New York, N. Y.
(See page 847.)

PENINSULAR Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

SPACKE Machine Co., F. W., Indianapolis, Ind.
(See page 325.)

WAINWRIGHT & Son, W. W., Connersville, Ind.
(See page 797.)

WATERBURY Welding Co., 1147 South St., Waterbury, Conn.
(See page 805.)

TAPER PINS

BELVIDERE Screw & Machine Co., Belvidere, Ill.

CASSADY-FAIRBANK Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

CHICAGO Nut Co., 2513-39 W. 20th St., Chicago, Ill.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill.
(See pages 287 and 443.)

CORBIN Screw Corp., New Britain, Conn.
(See page 831.)

DETROIT Screw Works, Detroit, Mich.
(See page 849.)

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PINS (Continued)

TAPER PINS (Continued)

FERRY Cap & Set Screw Co., 2151 Scranton Rd., Cleveland, O.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn.
(See page 383.)

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL Sewing Machine Co., Belvidere, Ill.

PENINSULAR Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

PRATT & Whitney Co., Hartford, Conn.
(See page 661.)

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SCREW Machine Products Corp., 1012 Eddy St., Providence, R. I.

STANDARD Tool Co., 6900-34 Central Ave., Cleveland, O.

U. S. Automatic Co., Amherst, O.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.
(See page 441.)

PIPE

WROUGHT IRON AND STEEL PIPE

BYERS Co., A. M., 235 Water St., Pittsburg, Pa.

CRANE Co., 836 S. Michigan Ave, Chicago, Ill.

LA BELLE Iron Works, Steubenville, O.

MARK Mfg. Co., Chicago, Ill.

NATIONAL Tube Co., Frick Bldg., Pittsburg, Pa.

SPANG, Chalfant & Co., Union Bank Bldg., Pittsburg, Pa.

YOUNGSTOWN Sheet & Tube Co., Youngstown, O.

PIPING

EXHAUST AND INTAKE PIPING

(See Manifolds, Exhaust)

PISTONS

FINISHED AND MACHINED PISTONS

AALDING Mfg. Co., Manchester, N. H.
(See page 739.)

ALUMINITE—See Green Engineering Co.

AUTO Engine Works, St. Paul, Minn.
(See page 219.)

BUTLER Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind.
(See page 747.)

FEATHERWEIGHT Piston Co., 11 Guyman Way, Pittsburgh, Pa.

FERRO Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

GREEN Engineering Co., Dayton, O. "Aluminite."
(See page 869.)

HOUPERT Machine Co., 349 W. 52d St., New York, N. Y.
(See page 847.)

MILLER Carburetor Sales Corp., 2526 Michigan Ave., Chicago, Ill.
(See page 597.)

MODERN Electric & Machine Co., 946 Fort Wayne Ave., Indianapolis, Ind. "R. & M."

PONDALLOY—See Pondelick's Piston Ring Co.

PONDELICK'S Piston Ring Co., 215 S. Leavitt St., Chicago, Ill. "Pondalloy."

PRECISION Auto Parts Co., 244 W. 49th St., New York, N. Y.

R. & M.—see Modern Electric & Machine Co.

SPACKE Machine Co., F. W., Indianapolis, Ind.
(See page 325.)

SPENCER-SMITH Machine Co., Howell, Mich.

WAINWRIGHT & Son, W. W., Connersville, Ind.
(See page 797.)

WATERBURY Welding Co., 1147 South St., Waterbury, Conn.
(See page 805.)

WHITMAN Luvium Metal Mfg. Co., 6900 S. Broadway, St. Louis, Mo.

WRIDGWAY Co., 331 Oak St., Scranton, Pa. "Zephyr."

ZEPHYR—See Wridgway Co.

PLATES

NAME PLATES

AMERICAN Name Plate & Engraving Co., 853 Atlantic Ave., Boston, Mass.

BERNARD Co., J., 422-30 E. 53d St., New York, N. Y.

BLACKINTON & Co., V. H., Attleboro Falls, Mass.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CHANDLER Co., Napier St., Springfield, Mass.

CHILDS & Co., S. D., 136 S. Clark St., Chicago, Ill.

COLGAN Co., J. W., Sudbury Bldg., Boston, Mass.

CROWE Name Plate & Engraving Co., Chicago, Ill.
(See page 699.)

ELECTRO-CHEMICAL Engraving Co., 450 19th St., Brooklyn, N. Y.

EMMONS Specialty Co., 241 E. Jefferson Ave., Detroit, Mich.

ETCHING Company of America, 2526-28 W. Congress St., Chicago, Ill.

FEDERAL Name Plate & Novelty Co., 732 Federal St., Chicago, Ill.

GRAMMES & Sons, L. F., 344 Union St., Allentown, Pa.

GREENDUCK Co., Van Buren & Hoyne Aves., Chicago, Ill.

HAEUSERMANN Metal Mfg. Co., 1098-1102 Brook Ave., New York, N. Y.

HANSON Co., C. H., 178 N. Clark St., Chicago, Ill.

HENDERSON-AMES Co., Main, Park & Water Sts., Kalamazoo, Mich.

HIGHTON & Sons Co., Wm., Nashua, N. H.

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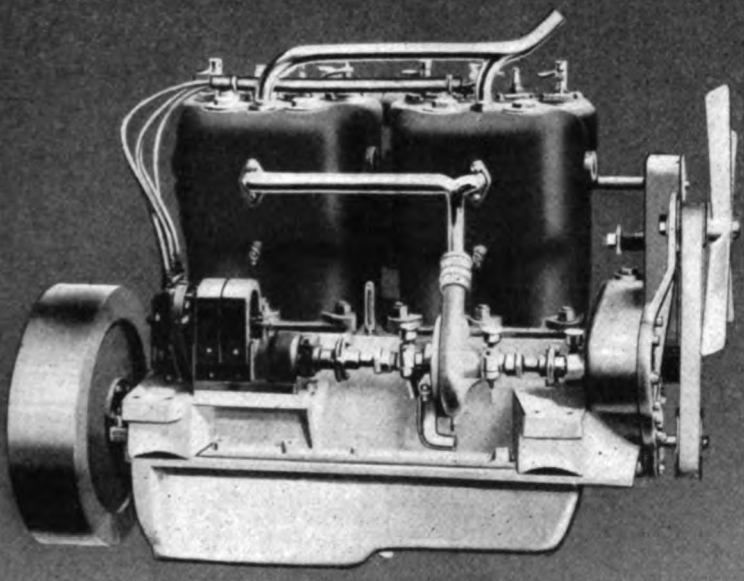

Power, economy, reliability are the essential requisites of a motor for efficient truck service. These three qualities are combined to the extreme degree in

Waukesha
TRADE MARK REG.

Motors for Trucks

Designed and built especially for motor truck service—not merely pleasure car motors built heavier or geared lower. Practicable design and superior construction afford maximum strength and power combined with exceptional lightness.

Truck users—prospective buyers—truck manufacturers—write for *THE FACTS*

Waukesha Motor Co., Waukesha, Wis.

Pioneer Builders of Truck and Tractor Motors Exclusively

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PLATES (Continued)

NAME PLATES (Continued)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

MAYER Co., Geo. J., 36 S. Meridian St., Indianapolis, Ind.

MULHAUPT, F., Jos., 301-05 N. Fifth St., Lafayette, Ind.

MURDOCK, Jr. Co., Jas., 116 Opera Pl., Cincinnati, O.

NESS, Jr., Geo. M., 61 Fulton St., New York, N. Y.

NEW York Stencil Works, 100 Nassau St., New York, N. Y.

O'CONNOR, James, Nevada Bldg., Cincinnati, O.

PREMIER Metal Etching Co., 617-21 E. 18th St., New York, N. Y.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

SHEPARD Mfg. Co., 364 Franklin St., Melrose Highlands, Mass.

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

STAFFORD Co., N., 87 Fulton St., New York, N. Y.

TURNER Brass Works, Sycamore, Ill.

WALTER & Sons, N. C., 3 Park Row, New York, N. Y.

WATSON Co., Mechanics St., Attleboro, Mass.

WHITEFORD & Co., Jos. G., 165 N. Jefferson St., Chicago, Ill.

WHITEHEAD & Hoag Co., 272 Sussex Ave., Newark, N. J.

WRIGHT & Son, Greg. G., 119-21 Opera Pl., Cincinnati, O.

YEUELL Co., E. V., Middlesex Ct., Malden, Mass.

PLATING

BRASS AND NICKEL PLATING

AJAX Plating & Specialty Mfg. Co., 1400 Niagara St., Buffalo, N. Y.

AMERICAN Chain Co., Bridgeport, Conn.
(See page 157.)

BERNARD Co., J., 422-30 E. 53d St., New York, N. Y.

BOESCH Lamp Co., 1135 Mission St., San Francisco, Cal.

BOSTON Nickel Plating Co., 160 Portland St., Boston, Mass.

CHENEY & Son, S., Manlius, N. Y.

COLUMBUS Auto Parts Co., 215-31 E. Russell St., Columbus, O.
(See page 763.)

CREUTZ Plating Co., Fifth & Elm Sts., Cincinnati, O.

DETLAFF, A. J., 121 E. Lafayette Ave., Detroit, Mich.

ERIE Stamping & Mfg. Co., 644-48 W. 12th St., Erie, Pa.

EXETER Brass Works, Exeter, N. H.

FITCHBURG Plating Works, rear 2 Main St., Fitchburg, Mass.

HILLMAN Auto Supply Mfg. Co., 98 Massachusetts Ave., Boston, Mass.

HOLT & Beebee Co., 51 Chardon St., Boston, Mass.

HOOSIER Auto Parts Co., Muncie, Ind.

JOHNSON Bronze Co., New Castle, Pa.

KEYLESS Lock Co., 1401 Newman St., Indianapolis, Ind.

METROPOLITAN Mfg. Co., Detroit, Mich.
(See page 479.)

NEHLS Plating Works, 248 Brush St., Detroit, Mich.

ROCKFORD Metal Specialty Co., 720 S. Main St., Rockford, Ill.

VOELKNER & Harry Mfg. Co., 282-92 Woodbridge St., E., Detroit, Mich.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

PLATINUM.

(See also Points, Sparking)

AMERICAN Platinum Works, 225-31 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Newark, N. J.
(See page 437.)

BISHOP & Co., Platinum Works, J., Malvern, Pa.

COMMERCIAL Research Co., Jackson Ave. & Honeywell St., Long Island City, N. Y.
(See page 679.)

DEE & Co., Thos. J., Mallers Bldg., Chicago, Ill.

GOLDSMITH Bros. Smelting & Refining Co., Heyworth Bldg., Chicago, Ill.

NEY Co., J. M., 265 Asylum St., Hartford, Conn.

PLATT Co., C. S., 29 Gold St., New York, N. Y.

R. & H. Platinum Works, 100 William St., New York, N. Y.
(See page 787.)

WILSON Co., H. A., 97 Chestnut St., Newark, N. J.

PLIERS

TIRE REPAIR PLIERS

M-E Co., Great Northern Bldg., Chicago, Ill.

NATIONAL Cutlery Co., Westmoreland & Boudinot Sts., Philadelphia, Pa.

PLUGS

CHARGING PLUGS AND RECEPTACLES

ANDERSON Mfg. Co., Albert & J. M., 289 A St., Boston, Mass.

GENERAL Electric Co., Schenectady, N. Y.

LANG Electric Co., J., 428 N. Lincoln St., Chicago, Ill.

RUSSELL & Stoll Co., 48 Cliff St., New York, N. Y.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

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Extreme simplicity of design admits of plug being taken apart and cleaned, if necessary, and re-assembled many times, with no resultant leakage or damage.

MASTER

Calorite Spark Plugs

The highest achievement in Spark Plug Construction. Few Spark Plugs today can muster so many points of excellence—

Calorite Insulator

Subjected to violent changes of temperature and severe electrical tests—proved itself a superior insulating material for Master Quality Plugs—

QUALITY
Because only the most efficient materials for their respective functions regardless of cost enter into the construction of Master Calorite Spark Plugs—

DEPENDABILITY
Because of the extreme tests to which Master Calorite Spark Plugs were subjected—Heated Red Hot 1500 degrees and instantly plunged into cold water. (This was repeated 26 times)—Then Heated White Hot and plunged into cold water—An instant change in temperature of 2000 degrees—(This rigid test was repeated 10 times)—Master Calorite Spark Plugs will not break under extremes of heat or cold—nor strains of expansion and contraction.

SIMPLICITY OF DESIGN
Admits of plug being taken apart, cleaned if necessary and re-assembled many times with no resultant leakage or damage—

Our experience over a period of many years in manufacturing Spark Plugs and Spark Plug Parts—and the radical tests of our engineers high in the automobile industry tend to show that Master Calorite Plugs mark the highest achievement in Spark Plug construction—

All purchasers are protected by the following:

"We guarantee Master Calorite Spark Plugs against defects of material or workmanship, and will replace, free of charge, any CALORITE insulators broken by heat, which are returned to us transportation prepaid."

Master Calorite Spark Plugs instantly appeal to the discriminating car owner, dealer, jobber and marine engine manufacturer as the spark plug "Par Excellence"—

Six Styles—Half Inch Regular—⅞" Regular—Metric—Model "F" for Fords and Reos—⅞" Long—Half Inch Long.

Send for Descriptive Literature explaining Calorite superiority

Attractive Display Stand in four colors, 14x20", is now ready for aggressive dealers stocking Master Calorite Spark Plugs. If you have Master Spark Plugs in stock and have not received your Display Stand write for it at once.

Calorite
Extra Long
$1.25 Each

MASTER CALORITE SPARK PLUGS
Made in U. S. A.

Manufactured and Guaranteed by

THE HARTFORD MACHINE SCREW COMPANY

MAIN OFFICE AND WORKS
484 Capitol Avenue HARTFORD, CONN.

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PLUGS (Continued)

CORE HOLE PLUGS

HUBBARD Spring Mfg. Co., Pontiac, Mich.
(See page 679.)

SPARK PLUGS

A. C.—See Champion Ignition Co.

A-K—See Angsten-Koch Co.

A. S. C.—See Gas Motor Efficiency Co.

AJAX—See Champion Spark Plug Co.

ALBRIGHT Ignition Co., Columbus, Ga.

ALDING—See Alsten & Goulding Co.

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

ANDERSON Spark Plug Co., 206 N. Holliday St., Baltimore, Md.
(See page 395.)

ANDRAE & Sons Co., Julius, Broadway & Michigan Sts., Milwaukee, Wis.

ANGSTEN-KOCH Co., 215-19 Englewood Ave., Chicago, Ill. "A-K."

ANSWER—See Hill Insulating & Mfg. Corp.

ARCLITE—See Long Bros.

ARROW—See Reflex Ignition Co.

AUBURN—See New York Mica & Mfg. Co.

AUBURN Ignition Mfg. Co., Auburn, N. Y. "Blazer."
(See page 451.)

AXWELL Equipment Co., Ferguson Bldg., Pittsburg, Pa.

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

B-G—See Batchelder-Gallant Co.

BABY—See Reflex Ignition Co.

BATCHELDER-GALLANT Co., Boston, Mass. "B-G."
(See page 395.)

BELVIDERE Screw & Machine Co., Belvidere, Ill.

BENFORD Mfg. Co., Box H, Mt. Vernon, N. Y. "Monarch," "Golden Giant."
(See page 695.)

BENTON Co., L. F., Vergennes, Vt.

BERGIE National Spark Plug Co., Seventh St. & 19th Ave., Rockford, Ill.

BETHLEHEM—See Silvex Co.

BI-SPARK Plug Co., Toledo, Ia.

BIGSBY-ROTARY Mfg. Co., 7500 Quincy Ave., Cleveland, O. "Vital," "Leader."

BINGHAM Mfg. Co., West Park, O. "Snappon."

BLAZER—See Auburn Ignition Mfg. Co.

BLICKENSDERFER & Co., G. C., Stamford, Conn. "Bulls Eye."

BLITZ—See Randall-Faichney Co.

BOBRA Spark Plug Co., Dayton, O.

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

BOUGIE-MERCEDES—See Herz & Co.

BROCKETT-GORHAM Co., N. State St., Marion, O. "Bro-Gor."

BRO-GOR—See Brockett-Gorham Co.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

BULL—See Reflex Ignition Co.

BULLS EYE—See Blickensderfer & Co.

BURNHAM Spark Plug Co., East Edgecomb, Me.

CHAMPION Ignition Co., Flint, Mich. "A. C.," "Titan," "Cico."
(See page 795.)

CHAMPION Spark Plug Co., 1014 Upton Ave., Toledo, O. "J-D," "Reliance," "Ajax," "Meteor," "Star," "Sta-Rite."
(See pages 385 to 388.)

CICO—See Champion Ignition Co.

CLIMAX Specialty Co., 1122 Nostrand Ave., Brooklyn, N. Y.

COMET—See Oakes & Dow Co.

COMMON SENSE—See Splitdorf Electrical Co.

DAY, Geo. F., 21 Haverhill St., Boston, Mass.

DE LUXE—See Lockwood-Ash Motor Co.

DETROIT—See Simplex Auto Specialty Co.

DOW Mfg. Co., 181 Adams St., Braintree, Mass.

DRAGON—See Silvex Co.

EAGLE—See Gas Motor Efficiency Co.

ECLIPSE Mfg. Co., Indianapolis, Ind. "Hercules."

EFFICIENCY—See Gas Motor Efficiency Co.

EKLIPS—See Fulton Co.

EXPRESS Spark Plug Co., 629 F St., N. W., Washington, D. C. "Firebrand."

EZEKLEEN—See Perpetual Spark Plug Co.

FAW, J. H., 41 Warren St., New York, N. Y. "Red Seal."
(See page 845.)

FIREBRAND—See Express Spark Plug Co.

FIREFLY—See Sharp Spark Plug Co.

FULTON Co., 708-10 National Ave., Milwaukee, Wis. "Eklips."
(See page 695.)

GAS Motor Efficiency Co., Janesville, Wis. "Efficiency," "A. S. C.," "X L," "Eagle," "Mogul."

GIANT—See Reflex Ignition Co.

GIBSON-HOLLISTER Mfg. Co., 3380 Washington St., Boston, Mass. "Jumbo Molite," "Red Elefant," "Jumbo Giant."
(See pages 391 and 392.)

GODDARD Spark Plug Co., Westboro, Mass.

GOLDEN GIANT—See Benford Mfg. Co.

GOLIATH—See Sharp Spark Plug Co.

GRANBERY, S. W., 8 S. Dearborn St., Chicago, Ill. "Oh! Gee."
(See page 435.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "Red-Head."
(See page 829.)

H. M. S. BULL DOG—See Hartford Machine Screw Co.

HAMPSHIRE Mfg. Co., Hatfield, Mass. "Wizard," "Rival."

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. "Master," "H. M. S. Bull Dog."
(See page 383.)

HEL-FI—See Motor Accessories Mfg. Co.

HERCULES—See Eclipse Mfg. Co.

Complete Index to Classification appears on Pages 8 to 27.

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Champion

"TOLEDO MADE FOR THE WHOLE WORLD'S TRADE"

Dependable Spark Plugs

If you should look under the hood of every automobile in your vicinity, you would find 4 out of every 5 motors equipped with Champion Spark Plugs.

Champion Spark Plugs are standard equipment on the Ford, Overland, Studebaker, Maxwell, King, Abbott-Detroit and over 150 other prominent makes of motors.

Think of it!

Over 80% of the automobiles made in America are equipped at their factories with Champion Spark Plugs. And knowing Champion quality thru **actual service,** the owners of these cars, quite naturally, want Champions when replacing their plugs.

Thus it is, that Champion dealers are assured of **continued** good business.

But this is only **part** of the story.

Our big national advertising in "The Saturday Evening Post," "Collier's," "Literary Digest," "Popular Mechanics," "Christian Herald" and over twenty-five automobile trade papers and farm papers is winning new business every day—telling more and more motorists about Champion dependability and getting them to specify Champions when buying new plugs.

And that is the reason, Mr. Dealer, why you should feature Champion Spark Plugs above all others.

Link your name with Champion by displaying Champion Spark Plugs in your window and on your counter and you will cash-in on Champion advertising that, without exception, reaches every motorist in your vicinity.

See next page for description of handsome display, containing $5.25 worth of Champion Spark Plugs and given FREE with your order for 100 Champion Spark Plugs. And ask your jobber about Champion Profit Sharing Agreement that pays you an extra profit on every plug you sell.

Cuts and Quotations on Next Page

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Champion

"TOLEDO MADE FOR THE WHOLE WORLD'S TRADE"

Dependable Spark Plugs

Special ½ in.
Price, $0.75

CHAMPION "X"

The Ford Plug

Adopted by the Ford Motor Co. as Standard equipment on the Ford Car since 1911.

The following is quoted from the Ford Manual in answer to No. 76.

"There is nothing to be gained by experimenting with different makes of plugs. The make of plugs with which Ford engines are equipped when they leave the factory are best adapted to the requirements of our motor."

Special ½ in.
Price, $1.00

CHAMPION "O"

The Overland Plug

Specially built for use in the Overland Car. Adopted as Factory equipment.

Numerous testimonials from car owners prove it to be the one dependable plug for the Overland under all conditions, giving maximum power and efficiency.

½ in. ⅞-18
Metric. Price
$1.00

CHAMPION
Conical
Plug

Adopted by the Studebaker Corporation as standard factory equipment on all Studebaker Cars.

½ in. ⅞-18
Metric. Price
$1.00

CHAMPION
Heavy
Duty

Standard factory equipment on the Briscoe, Abbott-Detroit, Jackson, King, Hollier, Peerless, Scripps-Booth, Stearns-Knight, Velie, Winton, and a large number of tractors and trucks.

½ in. ⅞-18
Metric. Price
$1.25

CHAMPION
One Piece
Heavy Stone

Specially made for cars of high power and compression. Extra heavy material throughout. Absolutely compression tight.

Regular factory equipment on such cars as Moline-Knight, Owen Magnetic, Overland "Six," Pathfinder, Peerless, White and Willys-Knight.

½ in. ⅞-18
Metric. Price
$1.00

CHAMPION
Regular

A most reliable plug, sturdy in construction patented Cup Gasket Assembly, making compression leakage impossible.

Adopted as Standard Equipment on Maxwell, Allen, Detroiter, Lambert, Luverne, Regal and other well known cars.

½ in. Ex. long
Price, $1.00

CHAMPION
Metz Plug
For Metz Cars

Adopted in 1913 as standard equipment on Metz cars.

This type of Champion Spark Plug was used in the Metz car which won the Glidden Tour in 1913, as well as many other victories.

⅞-18 Long
Price, $1.00

CHAMPION
Buick Plug
for Buick Cars

The Champion Regular ⅞-18 long plug is especially made for the Buick car. Has long shell, conical porcelain Buick Terminal.

The long shell allows the spark to ignite within the cylinder instead of in a pocket, as occurs when the ordinary type plug is used.

½ in. ⅞-18
Metric. Price
$1.25

CHAMPION
Two Piece
Heavy Stone

A highly efficient plug for such cars as Cadillac, Chalmers, Chandler, Franklin, Hudson, Locomobile Mitchell, Oldsmobile, Packard and Pierce-Arrow.

We guarantee complete satisfaction to the user, or free repair, replacement or money back

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DEALERS' PRICES

PLUGS	Less than 100	100 Lots
Champion "X"	.40c.	.38c.
Champion "O"	.45c.	.43c.
Champion Conical	.45c.	.43c.
Champion Heavy Duty	.45c.	.43c.
Champion One Piece Heavy Stone	.60c.	.57c.
Champion Regular	.45c.	.43c.
Champion Metz	.45c.	.43c.
Champion Buick	.45c.	.43c.
Champion Two Piece Heavy Stone	.60c.	.57c.

$5.25 Worth of

Champion Spark Plugs

And This Handsome Display

GIVEN FREE

This handsome Champion Spark Plug Display is about the slickest affair we've ever put out. It stands 19 inches high by 13 wide, trim and compact—too small to be in the way, yet so striking in design and color that a customer's attention is immediately attracted.

Unlike many displays, this Champion Stand carries the article it advertises—6 plugs being attached to the bottom of stand. (You may have all X plugs or three X and three 0.)

While you, or your clerk, are looking for the article requested by a customer, or wrapping the customer's package after a sale has been made, this little Champion "Salesman" gets in his work. "He" reminds the customer that new plugs are needed for his motor, and Mr. Customer, knowing the superiority of Champions, buys the necessary plugs. Result: Extra business—business that might have gone elsewhere had the customer not been reminded of his needs while in **your** store.

Enlist the aid of this little Champion "Salesman" today. An order for 100 or more Champion Spark Plugs brings "him" to your store prepaid.

ORDER THROUGH YOUR JOBBER TODAY

CHAMPION SPARK PLUG CO.

1014 Upton Avenue, TOLEDO, OHIO

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Champion

"TOLEDO MADE FOR THE WHOLE WORLD'S TRADE"

SPARK PLUGS FOR ALL MAKES OF CARS

PLEASURE CARS

Abbot-Detroit	Heavy Duty	⅞-18
Alco	Heavy Stone	⅞-18
Allen	Conical	⅞-18
Apperson	Conical	⅞-18
Auburn	Regular	⅞-18
Austin	Heavy Stone	⅞-18
Briscoe	Heavy Duty	⅞-18
Buick	Conical	⅞-18 Long
Cadillac	Heavy Stone	⅞-18
Case	Heavy Stone	⅞-18
Chalmers	Heavy Stone	⅞-18
Chandler	Heavy Stone	⅞-18
Chevrolet	Conical	⅞-18 Long
Cole	Conical	⅞-18
Continental	Regular	½"
Detroiter	Regular	½" Long
Dodge	Heavy Duty	⅞-18
Empire	Conical	⅞-18
Enger	Regular	⅞-18
Fiat	Heavy Stone	⅞-18
Ford	X	½"
Franklin	Heavy Stone	⅞-18
Garford	Heavy Stone	⅞-18
Grant	Conical	⅞-18
Haynes	Conical	⅞-18
Henderson	Conical	⅞-18
Hudson	Heavy Stone	⅞-18
Hupmobile	Conical	⅞-18
Imperial	Regular	⅞-18
Interstate	Regular	⅞-18
Jackson	Regular	⅞-18
Jeffery	Heavy Duty	⅞-18
King	Heavy Duty	⅞-18
Kissel Kar	Heavy Stone	⅞-18
Knox	Heavy Stone	⅞-18
Locomobile	Heavy Stone	⅞-18
Lozier	Heavy Stone	⅞-18
Luverne	Conical	⅞-18
Lyons-Knight	Heavy Stone	Metric
McFarlan	Heavy Stone	⅞-18
Marion	Heavy Stone	½" & ⅞-18
Marmon	Heavy Stone	⅞-18
Maxwell	Regular	⅞-18
Mercer	Heavy Stone	⅞-18
Metz	Regular	½-Ex. L.
Mitchell	Heavy Stone	½"
Moline	Heavy Stone	½"
Moon	Heavy Stone	½"
National	Heavy Stone	⅞-18
Oakland	Regular	⅞-18
Oldsmobile	Heavy Stone	⅞-18
Overland	"O"	½"
Overland "Six"	Heavy Stone	⅞-18
Packard	Heavy Stone	Metric
Paige-Detroit	Regular	⅞-18
Patterson	Regular	⅞-18
Pathfinder	Heavy Stone	⅞-18
Peerless	Heavy Stone	⅞-18
Pierce-Arrow	Heavy Stone	⅞-18
Premier	Heavy Stone	⅞-18
Pullman	Conical	⅞-18
Regal	Regular	½"
Reo	Regular	½"
Saxon	Regular	⅞-18
Scripps-Booth	Heavy Duty	⅞-18
Spaulding	Regular	⅞-18
Stearns-Knight	Heavy Stone	⅞-18
Studebaker	Conical	½"
Stutz	Heavy Stone	⅞-18
Velie	Heavy Stone	⅞-18
White	Regular	⅞-18
Willys-Knight	Heavy Stone	⅞-18
Winton	Heavy Stone	⅞-18

All Foreign Cars Regular.....Metric

COMMERCIAL CARS

Abendroth	Regular	½"
Adams	Regular	⅞-18
Akron-Ideal	Regular	⅞-18
Alco	Heavy Stone	⅞-18
American La France	Heavy Stone	⅞-18
Armeder	Regular	½"
Atterbury	Mica	⅞-18
Auglaize	Regular	½"
Autocar	Conical	⅞-18
Avery	Regular	½"
Barker	Regular	⅞-18
Beck	Regular	⅞-18
Bessemer	Regular	½"
Best	Regular	½"
Blair	Regular	⅞-18
Brennan	Regular	Metric
Brockway	Regular	⅞-18
Brown	Conical	⅞-18
Cass	Conical	½"
Chase	Heavy Stone	½"
Commer	Conical	½"
Commerce	Regular	½"
Croce	Regular	½"
Crown	Regular	½"
Dart	Heavy Stone	½"
Decatur	Regular	⅞-18
Denby	Regular	½"
DeKalb	Heavy Stone	⅞-18
Federal	Heavy Stone	⅞-18
G. J. G.	Regular	⅞-18
G. M. C.	Heavy Stone	⅞-18
Gabriel	Regular	⅞-18
Garford	Heavy Stone	⅞-18
Gramm-Bernstein	Conical	⅞-18
Hart-Kraft	Conical	½"
Harvey	Heavy Stone	⅞-18
Hatfield	Conical	⅞-18
Howe	Regular	⅞-18
Hupmobile	Regular	⅞-18
Hurlbut	Regular	⅞-18
Hydraulic	Conical	⅞-18
I. H. C.	Regular	⅞-18
Ideal	Regular	½"
Indiana	Regular	½"
KalDix	Regular	⅞-18
Kalamazoo	Heavy Stone	⅞-18
Kearns	Heavy Stone	½"
Kelly	Conical	⅞-18
Lauth-Juergens	Regular	⅞-18
Lippard-Stewart	Regular	⅞-18
Little Giant	Regular	½"
Mack, Saurer & Hewitt	Conical	⅞-18
Mais	Conical	⅞-18
Marmon	Conical	⅞-18
Martin	Regular	⅞-18
Menominee	Regular	⅞-18
Mercury	Regular	½" Long
Modern	Regular	½" & ⅞-18
Monitor	Regular	½"
Mason	Regular	½" & ⅞-18
Mora	Regular	½"
Morton	Conical	Metric
Packard	Heavy Stone	Metric
Packers	Regular	½"
Palmers-Moore	Regular	½"
Peerless	Heavy Stone	Metric
Pierce-Arrow	Heavy Stone	Metric
Plymouth	Regular	½"
Progress	Regular	⅞-18
Reo	Regular	½"
Republic	Regular	½"
Rockford	Regular	½"
Rowe	Regular	⅞-18
Royal	Heavy Stone	⅞-18
Sampson	Conical	⅞-18
Sanford	Regular	½"
Sandusky	Regular	½"
Schacht	Regular	⅞-18
Selden	Regular	⅞-18
Service	Conical	⅞-18
Siebert	Regular	½"
Smith-Milwaukee	Regular	⅞-18
Spaulding	Regular	½"
Speerer	Heavy Stone	⅞-18
Standard	Regular	½"
Steel	Mica	⅞-18
Sternberg	Mica	⅞-18
Stewart	Regular	⅞-18
St. Louis	Regular	½" & ⅞-18
Studebaker	Regular	½"
Sullivan Car	Regular	½"
Tiffin	Regular	⅞-18
U. S.	Regular	⅞-18
Universal	Conical	⅞-18
Utility	Regular	½"
Van	Regular	½"
Kissel	Heavy Stone	⅞-18
Kline	Regular	⅞-18
Knox	Conical	⅞-18
Koehler	Regular	⅞-18
Krebs	Regular	⅞-18
Lambert	Regular	⅞-18
Lange	Regular	⅞-18
Victor	Regular	½"
Vulcan	Regular	½"
Wagenhals	Regular	⅞-18
White	Heavy Stone	Metric
Wichita	Regular	⅞-18
Wilcox Trux	Conical	⅞-18
Willet	Regular	½"
Willys-Utility	Regular	⅞-18

WRITE US FOR DEALER HELPS

Champion Spark Plug Co., 1014 Upton Ave., Toledo, Ohio

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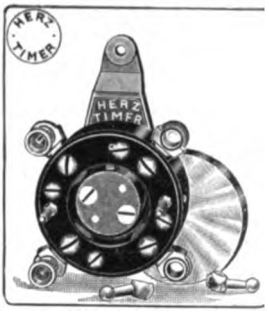
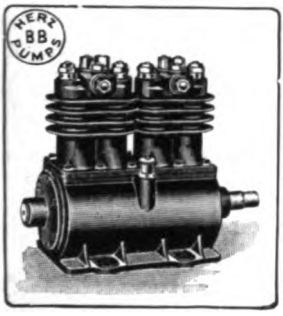
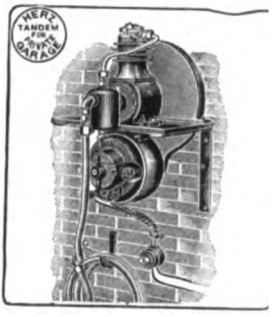
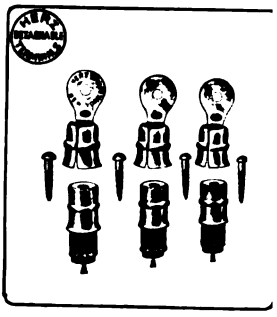
HERZ

PLUGS are the BEST on Earth









THE "BOUGIE MERCEDES"

Burns up the Soot!

Lasts for years!

The famous "Clover Leaf" electrode guarantees that full, deep-throated explosion which means power. The double-stone insulation cannot crack. Herz Plugs will outlast your motor!

Dealers—Write for the HERZ PLUG DIRECTORY

HERZ & CO.

245 W. 55th Street, New York

WRITE FOR THE GENERAL CATALOG

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PLUGS (Continued)

SPARK PLUGS (Continued)

HERZ & Co., 245 W. 55th St., New York, N. Y. "Bougie-Mercedes."
(See page 389.)

HILL Insulating & Mfg. Corp., 511-13 W. 42d St., New York, N. Y. "Answer."
(See page 393.)

IDEAL Switch Co., Plainville, Conn.

J-D—See Champion Spark Plug Co.

J-M—See Johns-Manville Co.

JEWELL—See Pittsfield Spark Coil Co.

JIFFY Specialty Co., McKeesport, Pa.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M."

JOHNSON Bros., 803 Downing St., Denver, Colo.

JUMBO JIANT—See Gibson-Hollister Mfg. Co.

JUMBO MOLITE—See Gibson-Hollister Mfg. Co.

KID—See Reflex Ignition Co.

KINGSTON—See Kokomo Electric Co.

KNOBLOCK-HEIDEMAN Mfg. Co., Sample St. & Vistula Ave., South Bend, Ind. "Quick Action."

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

KOPPER King—See Sharp Spark Plug Co.

LEADER—See Bigsby-Rotary Mfg. Co.

LEADER—See Long Bros.

LEHMAN Mfg. Co., J. H., 727 Seventh Ave., New York, N. Y.

LIGHTNING—See Reflex Ignition Co.

LION—See Rex Ignition Mfg. Co.

LOCKWOOD-ASH Motor Co., 514 Horton St., Jackson, Mich. "De Luxe," "Never Miss."

LONG Bros., Broadway & Buckeye St., Kokomo, Ind. "Leader," "Ramble," "Arclite."

LONG Distance Spark Plug Co., 212 S. Illinois St., Indianapolis, Ind.

M. C. D.—See McDowell, L. A.

MACGREGOR Co., Johns, Roslindale, Mass. "Viking."

McCORMICK Mfg. Co., First & Sears Sts., Dayton, O.

McDOWELL, L. A., Luverne, Minn. "M. C. D."

MASTER—See Hartford Machine Screw Co.

METER—See Champion Spark Plug Co.

MEZGER, C. A., Madison Ave. & 41st St., New York, N. Y. "Soot Proof."

MIKA—See V-Ray Co.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Victor."

MOGUL—See Gas Motor Efficiency Co.

MOGUL—See Reflex Ignition Co.

MONARCH—See Benford Mfg. Co.

MOSLER & Co., A. R., Mt. Vernon, N. Y. "Spit Fire," "Triumph," "Vesuvius," "Superior."

MOTOR Accessories Mfg. Co., Marshalltown, Ia. "Hel-Fi."

NEVER MISS—See Lockwood-Ash Motor Co.

NEW YORK Mica & Mfg. Co., Clark & Green Sts., Auburn, N. Y. "Auburn," "Wright."

OAKES & Dow Co., 15 Chardon St., Boston, Mass. "Comet," "Sootless."

OH! GEE—See Granbery, S. W.

PANTHER—See B. A. T. Co.

PECO—See Power & Efficiency Co.

PERFECTION Specialty Mfg. Co., 115-17 W. Second Ave., Cincinnati, O.

PERPETUAL Spark Plug Co., 830 E. Drinker St., Dunmore, Pa. "Ezekieen."

PITTSFIELD Spark Coil Co., Pittsfield, Mass. "Jewell."
(See page 169.)

PORTER & Co., W. S., 608 S. Dearborn St., Chicago, Ill. "Radium."

POWER & Efficiency Co., American & Mech. Bldg., Trenton, N. J. "Peco."

QUICK ACTION—See Knoblock-Heideman Mfg. Co.

RADIUM—See Porter & Co.

RAJAH Auto-Supply Co., Bloomfield, N. J.
(See page 393.)

RAMBLE—See Long Bros.

RANDALL-FAICHNEY Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Blitz."

RAYO Auto Supply Co., 255 Bridge St., Brooklyn, N. Y.
(See page 815.)

RED ELEFANT—See Gibson-Hollister Mfg. Co.

RED-HEAD—See Grossman Mfg. Co.

RED SEAL—See Faw, J. H.

RED SHIELD—See Wesco Supply Co.

REFLEX Ignition Co., 1710 Payne Ave., Cleveland, O. "Arrow," "Lightning," "Giant," "Bull," "Baby," "Kid," "Mogul."
(See page 675.)

RELIANCE—See Champion Spark Plug Co.

REX Ignition Mfg. Co., Broadway & 58th St., New York, N. Y. "Lion."
(See page 395.)

RIVAL—See Hampshire Mfg. Co.

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

SHARP Spark Plug Co., 3343 Broadview Rd., Cleveland, O. "Firefly," "Goliath," "Kopper King."

SILVEX Co., 171 Madison Ave., New York, N. Y. "Bethlehem," "Dragon."

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich. "Detroit."

SNAPPON—See Bingham Mfg. Co.

SOOT PROOF—See Mezger, C. A.

SOOTLESS—See Oakes & Dow Co.

SPEEDWAY Plug Co., 1506 Harrison Ave., Cincinnati, O.

SPIT FIRE—See Mosler & Co.

SPLITDORF Electrical Co., Newark, N. J. "Common Sense."

SPOON Point Spark Plug Co., La Porte, Ind.

STA-RITE—See Champion Spark Plug Co.

STAR—See Champion Spark Plug Co.

STAR Specialty Co., Hartman Bldg., York, Pa.

SU-DIG—See Superior Motor Power Co.

Complete Index to Classification appears on Pages 8 to 27.

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Jumbo Jiant made in the following sizes: ⅞ in.—18 SAE; ½ in. pipe; metric; ⅞ in.—18 long; ½ in. long.

JUMBO SPARK PLUGS

offer the up-to-date dealer an opportunity to put his ignition business on a solidly profitable footing.

The plugs themselves give the sort of ignition service that is definitely and positively assured only by Jumbo design and Jumbo construction — service that we could not improve even though we were to build Jumbo plugs of solid gold.

And we assist the dealer in every possible way. Our aggressive advertising campaigns have impressed the Jumbo name and trademark firmly in the minds of car owners—but we do not stop there.

Jumbo Molite made in the following sizes: ⅞ in.—18 SAE; ½ in. pipe; metric; ⅞ in.—18 long; ½ in. long.

We offer transparent window signs, handsome ten color lithographed hangers, display stands and sample cases for the counter and show case, descriptive folders, large display boxes for the window, and helpful hints on striking sales displays.

We want every Jumbo dealer to know that we stand squarely back of him, not only in the quality of our plugs, but also in the quality of our Dealer service.

GIBSON-HOLLISTER M'F'G CO.,

3380 Washington Street, :: Boston, Mass.

DISTRIBUTING BRANCHES:

Des Moines, Iowa	Denver, Colo.	Birmingham, Ala.
Minneapolis, Minn.	Salt Lake City, Utah	Atlanta, Ga.
Nashville, Tenn.	Indianapolis, Ind.	St. Johnsbury, Vt.
Chicago, Ill.	Portland, Ore.	Worcester, Mass.
St. Louis, Mo.	New York City, N. Y.	Portland, Me.
Louisville, Ky.	Buffalo, N. Y.	Springfield, Mass.
Pittsburgh, Pa.	Cincinnati, Ohio	Hartford, Conn.
Cleveland, Ohio	El Paso, Texas	Montreal, Canada
Kansas City, Mo.	San Francisco, Cal.	

69-27

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Jumbo Junior made in the following sizes: ⅞ in. —18 SAE; ½ in. pipe.

Jumbo Ford Special, ½ in. pipe.

Jumbo Motor Cycle Special made in ⅞ in.—18; metric.

STYLE	PRICE LIST SIZES	LIST	TRADE QUANTITIES 1 to 50	TRADE QUANTITIES 50 to 100
JUMBO MOLITE Molite Insulation	⅞–18 SAE, ½" Pipe, Metric, ⅞–18 Long	$1.25	$0.60	$0.58
JUMBO JIANT Double Porcelain Insulation	⅞–18 SAE, ½" Pipe, Metric, ⅞–18 Long, ½" Long	1.00	.52	.50
JUMBO JUNIOR Double Porcelain Insulation	⅞–18 SAE, ½" Pipe, Metric	.75	.42	.40
JUMBO MOTOR CYCLE Special Molite Insulation	⅞–18 SAE, Metric	.75	.42	.40
JUMBO FORD SPEC. Molite Insulation	½" Pipe	1.00	.45	.43
JUMBO FORD SPEC. Double Porcelain Insulation	½" Pipe	.75	.37	.35

COPPER ASBESTOS WASHERS

	List		Trade
For Jumbo Molite			
Top	13c	38c per doz.	$1.90 per 100
Bottom	13c	44c per doz.	2.14 per 100
For Jumbo Jiant			
Top	13c	38c per doz.	1.90 per 100
Bottom	13c	44c per doz.	2.14 per 100
For Jumbo Jr. & Ford Special			
Top	7c	38c per doz.	1.90 per 100
Bottom	7c	38c per doz.	1.90 per 100
Metric and ⅞ SAE	5c	25c per doz.	1.25 per 100

TERMINALS

	List	Trade
Universal	13c	$3.15 per 100
Standard	7c	2.20 per 100

PORCELAINS

	List	Trade		List	Trade
Jumbo Molite	$1.00	42c	Ford Molite	75c	32c
Jiant	75c	32c	Motor Cycle Special— Molite	50c	32c
Junior	50c	26c			
Ford	40c	23c			

GIBSON-HOLLISTER M'F'G CO.,

3380 Washington Street, :: Boston, Mass.

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RAJAH

PLUGS

Used by more than 80% of the winning cars at

Sheepshead Bay, May 13, 1916

Indianapolis, May 30, 1916

Chicago, June 11, 1916

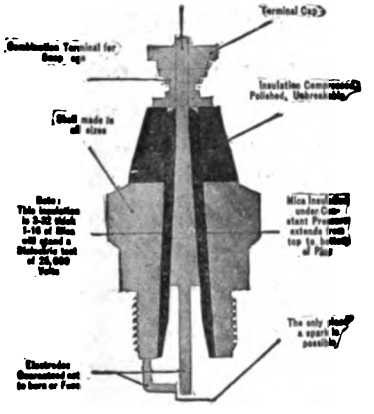
RAJAH TERMINALS

Recognized by the trade and manufacturers as the standard for Ignition, Starting and Lighting Systems.

RAJAH AUTO-SUPPLY COMPANY
Bloomfield, N. J.

The "ANSWER"

A new Basic Principle—Insulated Everywhere



PRICE $0.70

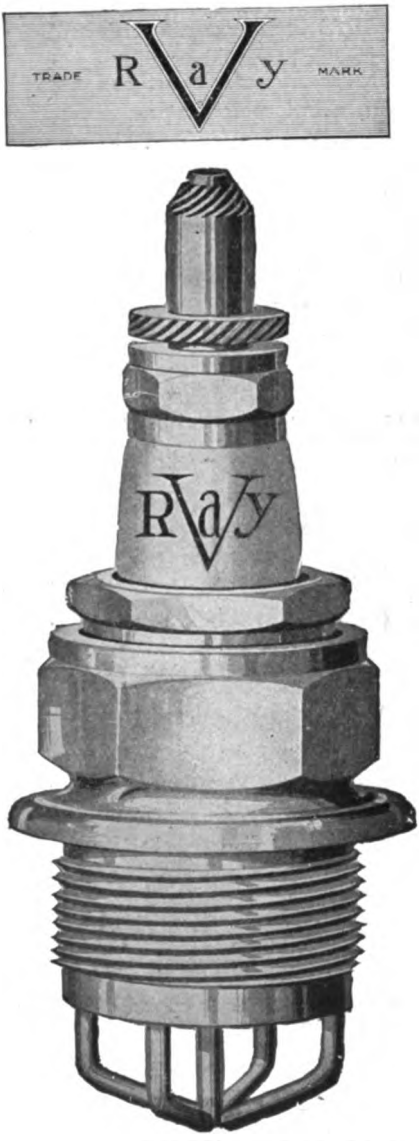
This plug is the ANSWER to the motorist who wants a dependable plug, a gas-tight plug and one that is unbreakable even with careless handling or abuse.

Study the diagram. Your experience will tell you that this plug is without a weakness or a structural flaw.

A guarantee goes with every ANSWER..... a guarantee of complete satisfaction to your customers.

We are selling service—not merely spark plugs. Attractive Discounts

HILL INSULATING & MFG. CORP.,
511-13 W. 42d St., New York, N. Y.



V-Ray

"GRIEF-PROOF"

QUALITY IS PARAMOUNT

The V-Ray Co.

MARSHALLTOWN IOWA
Coast Branch: SAN DIEGO, CALIF.

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PLUGS (Continued)

SPARK PLUGS (Continued)

SU-TON—See Superior Motor Power Co.

SUPERIOR—See Mosler & Co.

SUPERIOR Motor Power Co., 26 Irving Pl., New York, N. Y. "Su-Dig," "Su-Ton."

THOMASSON Mfg. Co., North Branch, Minn.

3-X Spark Plug Co., 2129 Michigan Ave., Chicago, Ill.

TITAN—See Champion Ignition Co.

TRIUMPH—See Mosler & Co.

UKO—See Utility Co.

UTILITY Co., 636 W. 44th St., New York, N. Y. "Uko."

V-RAY Co., Marshalltown, Ia. "Mika." (See page 393.)

VESUVIUS—See Mosler & Co.

VICTOR—See Milwaukee Auto Specialty Co

VIKING—See MacGregor Co.

VITAL—See Bigsby-Rotary Mfg. Co.

WASCO—See Washington Automobile Supply Co.

WASHINGTON Automobile Supply Co., Washington, Ill. "Wasco."

WESCO Supply Co., Seventh St. & Clark Ave., St. Louis, Mo. "Red Shield."

WILLIAMS, E. Q., 535-39 S. Clinton St., Syracuse, N. Y.

WIZARD—See Hampshire Mfg. Co.

WRIGHT—See New York Mica & Mfg. Co.

X L—See Gas Motor Efficiency Co.

XXX Auto Accessory Co., Springfield, Mass.

TIRE REPAIR PLUGS

CONLEY, G. F., 1326 Michigan Ave., Chicago, Ill.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic." (See page 685.)

GOODRICH Co., B. F., Akron, O.

SAMPSON—See Stevens & Co.

SPITLER Puncture Plug Co., 1790 Broadway, New York, N. Y.

STEVENS & Co., 275 Broadway, New York, N. Y. "Sampson." (See page 813.)

TINGLEY & Co., Chas. O., Rahway, N. J.

VITALIC—See Continental Rubber Works.

YATMAN Rubber Co., 267-69 Mt. Pleasant Ave., Newark, N. J.

POCKETS

TRUCK STAKE POCKETS

EBERHARD Mfg. Co., 2734 Tennyson Ave., Cleveland, O.

POINTS

SPARKING POINTS

(See also Platinum)

AMERICAN Platinum Works, 325-31 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Newark, N. J. (See page 437.)

BISHOP & Co. Platinum Works, J., Malvern, Pa.

BROWN & Caine, 2112 Michigan Ave., Chicago, Ill.

CANADIUM—See Electro Metal Products Co.

COMMERCIAL Research Co., Jackson Ave. & Honeywell St., Long Island City, N. Y. "Comreco." (See page 679.)

COMRECO—See Commercial Research Co.

DRIVER-HARRIS Wire Co., Harrison, N. J. "Ignito."

ELECTRICAL Alloy Co., 41 Union Sq., New York, N. Y.

ELECTRO Metal Products Co., 1988 E. 66th St., Cleveland, O. "Canadium." (See page 783.)

H. & L. Mfg. Co., 33-35 Liberty St., New York, N. Y.

HEEREN Bros. & Co., Penn Ave. & Ellesmere St., Pittsburg, Pa.

IGNITO—See Driver-Harris Wire Co.

R. & H. Platinum Works, 100 William St., New York, N. Y. (See page 787.)

WILSON Co., H. A., 97 Chestnut St., Newark, N. J.

POLISHES

AUTOMOBILE BODY POLISHES

(See also Soaps, Automobile)

A B C Reviver—See Standard Varnish Works.

A-NO-ONE Polish Co., 363 Jefferson Ave., Rochester, N. Y.

ACME Polish Co., 71 S. 12th St., Pittsburg, Pa.

ADAMS & Elting Co., 713-26 Washington Blvd., Chicago, Ill. "Hy-Pol."

ADVANCE Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.

AFFINITY Co., Woodmen Bldg., Omaha, Neb.

ALDER Chemical Co., Mt. Vernon, N. Y. "Star."

AMERICUS Products Co., Detroit, Mich.

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup." (See page 179.)

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Century."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. (See page 177.)

AUTO GLOSS—See Hall-Thompson Co.

AUTO-GLOSS—See Indianapolis Paint & Color Co.

Complete Index to Classification appears on Pages 8 to 27.

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Simons Auto Kleen

Makes Dull, Tarnished
HOODS and FENDERS
BRIGHT and NEW

Cars Easily Cleaned and Polished

SIMONS AUTO KLEEN
The original and best cleaner for removing all blemishes—revives lustre, varnished and enamel surfaces.

SIMONS PASTE POLISH
Protects and Maintains original finish. Imparts Dry, Hard, Clear surface which resists all conditions.

SIMONS AUTO KLEEN & PASTE POLISH is packed in display cartons containing 6 each of Auto Kleen and Paste Polish which retail at 25c. each or 50c. per combination, $2.00 net per carton.

Used and Adopted by Leading Agencies, including Packard, Hudson, Dodge, Studebaker, Overland, Etc.

SIMONS MFG. COMPANY
2121 Michigan Ave., Chicago, Ill.

REX

Rules Them All With

Quality Spark Plugs

The Name REX Tells the Whole Story

Send for Catalogue

Rex Ignition Mfg. Co.
Broadway, 58th St. and 8th Ave.
New York City

Batchelder-Gallant Co.
Boston, Mass.

ANDERSON

GLASS AND STEEL SPARK-PLUG

A WELD OF GLASS AND STEEL

A WINDOW TO THE ENGINE

Better pay $1.50 once than a dollar a dozen times. That's about the ratio of Anderson Spark Plug life, compared with ordinary plugs.

ALL SIZES

Anderson Spark Plug Co.
206 North Holliday Street, Baltimore, Md.

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POLISHES (Continued)

AUTOMOBILE BODY POLISHES (Continued)

AUTO-NEWER—See Pimbley Paint & Glass Co.

AUTOGLOS Co., 42 Larned St., W., Detroit, Mich.

AUTOGLOSS—See Sisk Mfg. Co.

AUTO-KLEAN—See Lucas & Co.

AUTO KLEEN—See Simons Mfg. Co.

AUTOCLEAN—See Bridgeport Wood Finishing Co.

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

B. P. S.—See Patterson-Sargent Co.

BAILEYS—See Crown Mfg. Co.

BAUM'S Castorine Co., 104 N. George St., Rome, N. Y.

BE-BE-CO.—See Boston Blacking Co.

BEN-HUR Metal Polish Co., 103 E. Market St., Crawfordsville, Ind.

BLUE RIBBON — See International Metal Polish Co.

BLUE Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Premium."

BOBRICK Chemical Co., 111-17 S. Garey St., Los Angeles, Cal. "Three X."

BODY-NU—See Nu-Back Mfg. Co.

BOSTON Blacking Co. (East Cambridge), Cambridge, Mass. "Be-Be-Co."

BOSTON Spray Co., 28 Beach St., Boston, Mass.

BOYER Chemical Laboratory Co., 11 W. Austin Ave., Chicago, Ill.

BOYLE CO., A. S., 1917 Dana Ave., Cincinnati, O. "Old English." (See page 517.)

BRADLEY & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "Perma-Lac."

BRETT Dimmer Co., A. H., Mason City, Ia. "C. C."

BRIDGEPORT Wood Finishing Co., New Milford, Conn. "Autoclean."

BRILLIANT Products Co., 13 Park Row, New York, N. Y.

BROOKS & Co., Clarence, 249-77 Chestnut St., Newark, N. J.

BUFFALO Specialty Co., 375 Ellicott St., Buffalo, N. Y. "Liquid Veneer."

C. C.—See Brett Dimmer Co.

CALLERY & Co., W. W., 188 30th St., Pittsburg, Pa.

CENTURY—See Arnstein, Eugene.

CHAMBERLAIN Co., 305-09 Penn Ave., Pittsburgh, Pa.

CHEMICAL Specialties Co., 1522 Grand Ave., Kansas City, Mo. "Dozit," "Orient."

CHEMICAL Spray Co., 74 Pearl St., Boston, Mass.

CHICAGO White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill.

CINCINNATI Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Re-Nu."

CLEANOLA Co., Fulton Bldg., Pittsburg, Pa.

COLUMBUS Varnish Co., Columbus, O. "Peerless." (See page 209.)

COMMON-SENSE Mfg. Co., 4169 Olive St., St. Louis, Mo.

COOPER & Osterhout, 342 Vanduzer St., Watertown, N. Y. "Tarof."

CORTLAND Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Houts."

CROWN Mfg. Co., Indianapolis, Ind. "Baileys."

CUNNINGHAM—See Pitt Specialty Co.

DAYTON Polish Co., Bacon St., Dayton, O.

DETROIT White Lead Works, 530-60 Milwaukee Ave., E. Detroit, Mich. "Rogers."

DIAMOND Specialty Co., Indianapolis, Ind.

DIAMOND Polish Co., Brown Bldg., Washington, Pa.

DIXON Veneer Polish Co., 1020 Callowhill St., Philadelphia, Pa.

DORSEY Mfg. Co., 78 Broad St., Boston, Mass. "Victrolene."

DOZIT—See Chemical Specialties Co.

DOZIT—See Kirk Mfg. Co.

DU MOR Specialty Co., 1358 Walnut St., Cincinnati, O.

DULIN Mfg. Co., J. E., 460 S. Grant St., Springfield, Mo. "Dumaco."

DUMACO—See Dulin Mfg. Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie." (See pages 189 to 192.)

E-Z-KLEEN—See Rexine Co.

EBERSON-LINDSLEY Paint Co., 19th & Morgan Sts., St. Louis, Mo.

ECLAT Mfg. Co., 3425 S. State St., Chicago, Ill.

EZYBRITE—See Rodrigues, R. E.

FAULTLESS—See Hawkey Oil Co.

FINALINE Mfg. Co., 5027 Delmar Blvd., St. Louis, Mo.

FLINT Varnish & Color Works, Flint, Mich.

FRAZER Lubricator Co., 3921 Normal Ave., Chicago, Ill.

FREY Mfg. Co., 1503 Michigan Blvd., Chicago, Ill. "Protexacar."

GLOVER, E. O., 142 Nectarine St., Philadelphia, Pa.

GOLDEN STAR—See Morris Mfg. Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker," "Auto Gloss." (See page 171.)

HALLETT & Co., H. M., Ludington, Mich. "New Life."

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HEANEY Mfg. Co., 164 State St., Boston, Mass.

HERCULES Chemical Works, 2138 W. Van Buren St., Chicago, Ill. "Non-Such."

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Nugloss."

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

HOUTS—See Cortland Specialty Co.

HY-POL—See Adams & Elting Co.

IMPERIAL Oil Co., 3124 Locust St., St. Louis, Mo. "Marvin."

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WONDER-MIST

The automobile supply market knows no article that sells more readily—gives more universal satisfaction, and secures repeat orders oftener than *Wondermist.*

This is more than a claim—it is the experience of every jobber and dealer who has taken it on.

WONDERMIST is a non-inflammable, non-combustible and non-poisonous liquid cleanser for use on highly polished wood or metal surfaces—a cleansing polish which does not require the use of water to clean, nor laborious rubbing to create a polish. It is applied in the form of a fine mist by means of a sprayer, and not only cleans the surface of dirt and dust, oil and grease, but renews and restores the original luster of the finish.

Unlike water, WONDERMIST subtracts nothing from varnished surfaces—unlike polishes—wax or liquid—it adds nothing.

A quart of WONDERMIST applied with a sprayer is sufficient to restore a car, however much bespattered, to its shipping date appearance from fifteen to twenty times.

Garage men find it costs less to use WONDERMIST for cleaning automobile bodies than washing them with water—costs less, and is infinitely more satisfactory to their customers.

Write for our dealer's window display proposition and schedule of trade discounts.

PRICES:

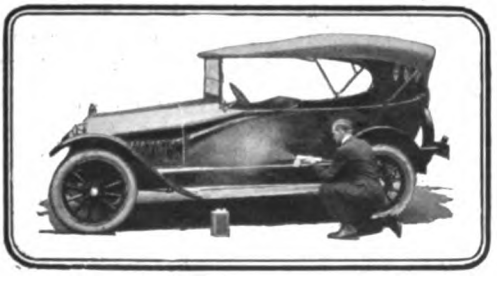
1 gallon	$3.00
½ gallon	2.00
1 quart	1.25

A sprayer is given free with each quart can of WONDERMIST.

Small cases contain 6 gallons, or 12 half gallons, or 12 quarts.

Distributors in each of the following cities:

Atlanta, Ga.
Atlantic City, N. J.
Baltimore, Md.
Bangor, Me.
Binghamton, N. Y.
Bloomington, Ill.
Burlington, Vt.
Boston, Mass.
Chicago, Ill.
Detroit, Mich.
Indianapolis, Ind.
Kansas City, Mo.
Manchester, N. H.
Milwaukee, Wis.



Distributors in each of the following cities:

New Haven, Conn.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Me.
Providence, R. I.
Quincy, Ill.
Reading, Pa.
St. Louis, Mo.
Scranton, Pa.
Springfield, Mass.
Troy, N. Y.
Washington, D. C.
Wilmington, Del.

The WONDER-MIST COMPANY, 1789 BROADWAY, NEW YORK CITY
14 FEDERAL ST., BOSTON, MASS.
162 N. DEARBORN ST., CHICAGO, ILL.

If your jobber can not supply you, write the nearest WONDERMIST branch.

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POLISHES (Continued)

AUTOMOBILE BODY POLISHES (Continued)

INDIANAPOLIS Paint & Color Co., 113 W. Chesapeake St., Indianapolis, Ind. "Auto-Gloss."

INGHAM'S—See Perfection Polish Co.

INSTANT Products Co., 15 W. Swan St., Buffalo, N. Y. "Life-O-Wood."

INTERNATIONAL Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

JEWEL—See Wadsworth-Howland Co.

JIFFY Specialty Co., McKeesport, Pa.

JOHNSON & Son, S. C., Racine, Wis.

KEEP-NEW—See Par-Kop Mfg. Co.

KIRK Mfg. Co., 1522 Grand Ave., Kansas City, Mo. "Dozit."

LE DOYEN, Frank J., 827 Mangold St., Baltimore, Md. "Var-Noil."

LEE Mfg. & Chemical Co., Wm. E., 622 Cypress Ave., Kansas City, Mo. "Varnishine."

LIFE-O-WOOD—See Instant Products Co.

LIQUID VENEER—See Buffalo Specialty Co.

LORD Polish Co., F. T., 37 Hovey Ave., Cambridge, Mass. "Sun-Glo."

LUCAS & Co., John, 322-30 Race St., Philadelphia, Pa. "Auto-Klean."

LUSTRE Mfg. Co., 16 W. Kinzie St., Chicago, Ill.

McDOUGALL Varnish Co., 1317 Elk St., Buffalo, N. Y.

MAGIC Mist Co., Prospect Ave. & E. Second St., Cleveland, O.

MAGICLEAN—See Schmoeger, Frederic A.

MAJESTIC—See Suydam Co.

MARAC Co., 44-60 E. 23d St., New York, N. Y. "Marvel."

MARATHON—See Weinberg & Co.

MARVEL—See Marac Co.

MARVEL-MIST Mfg. Co., 52 Greenpoint Ave., Brooklyn, N. Y.

MARVIN—See Imperial Oil Co.

MATCHLESS—See Standard Oil Co. of N. Y.

MEADOWCROFT Chemical Co., Saybrook, Conn. "Rite Brite."

MIRROLIKE Mfg. Co., 771 Lexington Ave., New York, N. Y.

MONARCH—See Suydam Co.

MONOGRAM—See New York Lubricating Oil Co.

MOORE Oil Co., York St. & McLean Ave., Cincinnati, O.

MORRIS Mfg. Co., R. W., Gumbel Bldg., Kansas City, Mo. "Golden Star."

NATIONAL Mfg. Co., 227 Portage St., Kalamazoo, Mich.

NAY Chemical Co., Tom, Holden, Mo.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill. "Relustro."

NEW LIFE—See Hallett & Co.

NEW Method Varnish Co., 434 Carroll St., Elmira, N. Y. "Uncle Hiram's."

NEW YORK Lubricating Oil Co., New York, N. Y. "Monogram."

NON-SUCH—See Hercules Chemical Co.

NORTHWESTERN Chemical Co., Marietta, O. "Pioneer." (See pages 172 and 173.)

NOVATO—See Puritan Soap Co.

NOXAL Polish Mfg. Co., 1233 Belmont Ave., Philadelphia, Pa.

NU-BACK Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Body-Nu."

NUBIAN Paint & Varnish Co., 1856 Le Claire Ave., Chicago, Ill. "Re-Vi-Var."

NUGLOSS—See Hollingshead Co.

O SO EZY Products Co., 264-68 Jefferson Ave., Detroit, Mich. (See page 835.)

OILZUM—See White & Bagley Co.

OLD ENGLISH—See Boyle Co.

ORIENT—See Chemical Specialties Co.

OSMACO—See Schlegel Mfg. Co.

PANTHER—See B. A. T. Co.

PAR-KOP Mfg. Co., 1522 Ingersoll St., Philadelphia, Pa. "Keep-New."

PATTERSON-SARGENT Co., E. 38th & St. Clair Sts., Cleveland, O. "B. P. S."

PEERLESS—See Columbus Varnish Co.

PERFECTION Polish Co., Waverly, N. Y. "Ingham's." (See page 857.)

PERMA-LAC—See Bradley & Vrooman Co.

PIMBLEY Paint & Glass Co., 910 S. Sixth St., St. Joseph, Mo. "Auto-Newer."

PIONEER—See Northwestern Chemical Co.

PITT Specialty Co., 1016 Congress St., N. S., Pittsburg, Pa. "Cunningham."

POLAC Co., Boston, Mass.

POUGHKEEPSIE Utilities Corp., 16 Winnikee Ave., Poughkeepsie, N. Y. "Utility."

PREMIUM—See Blue Ribbon Mfg. Co.

PROTEXACAR—See Frey Mfg. Co.

PURE Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Puritan."

PURITAN—See Pure Oil Co.

PURITAN Soap Co., 500 Exchange St., Rochester, N. Y. "Novato."

RAPID—See Shannon, T. R.

RAPID Shine Products Co., St. Louis, Mo.

RATH Mfg. Co., Hedley & Richmond Sts. (Frankford), Philadelphia, Pa.

REFINE Co., Sheboygan, Mich.

REID Mfg. Co., W. W., 204 Milk St., Boston, Mass. "Waxol."

RE-NU—See Cincinnati Oil Works Co.

RE-VI-VAR—See Nubian Paint & Varnish Co

RELUSTRO—See Nemo Chemical & Specialty Mfg. Co.

RENTZ Co., C. J., Greenwood Bldg., Cincinnati, O.

REXINE Co., Sheboygan, Wis. "E-Z-Kleen." (See page 811.)

RIE-NIE—See Durkee-Atwood Co.

RITE-BRITE—See Meadowcroft Chemical Co.

ROBERTSON Machine & Foundry Co., 58 Rano St., Buffalo, N. Y. "Sta-Bright."

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FOR EVERY AUTO-LAMP

WARNER-LENZ

The Warner-Lenz takes the place of any ordinary glass lens in any auto-lamp of any size. It spreads out the light both sides of the car and in front. This lets the motorist see everything 300 to 500 feet away. Yet it avoids the blinding glare prohibited by law. It also eliminates the necessity of dimmers that make lamps dangerously weak. Police and public endorse the Warner-Lenz.

Thousands Selling Monthly
Get Your Share of These Profits

A country-wide response has met our full-page advertisements in Saturday Evening Post, Collier's Weekly and other powerful publications. And orders are coming in from every quarter.

Here is your chance to connect with easy sales and liberal profits. Scores of motorists now writing to us will go to you if you can supply them. Hosts of others who do not take the trouble to write can be easily sold if you show them this scientific lens.

Send a trial order at once. See how easy Warner-Lenzes sell to any car owner.

Retail Prices Per Pair

Diameter in inches.	East of Rockies	West of Rockies
5 to 9, inclusive	$3.50	$3.75
9¼ to 10, inclusive	4.00	4.25
10¼ to 12, inclusive	5.00	5.25

Jobber and Dealer

Discounts on Application

THE WARNER-LENZ COMPANY

914 S. Michigan Avenue **CHICAGO**

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POLISHES (Continued)

AUTOMOBILE BODY POLISHES (Continued)

RODRIGUEZ, R. E., 56-58 Warren St., New York, N. Y. "Ezy Brite."

ROGERS—See Detroit White Lead Works.

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y.
(See page 285.)

S. & B.—See Uno Mfg. Co.

ST. LOUIS Surfacer & Paint Co., Arlington Ave. & Terminal Belt Line, St. Louis, Mo.

SCHLEGEL Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y. "Osmaco."

SCHMOEGER, Frederic A., Sterling, Ill. "Magiclean."

SHANNON, T. R., 19 Lorraine St., Hartford, Conn. "Rapid."

SHI-NUP Corp., Yonkers, N. Y.

SHINAUTO Mfg. Co., 1422 N. Illinois St., Indianapolis, Ind.

SIMONS Mfg. Co., 2121 Michigan Ave., Chicago, Ill. "Auto Kleen"
(See page 395.)

SISK Mfg. Co., R. J., New London, Conn. "Autogloss."

SLIKUP—See Arnold, N. B.

SPARKLER Mfg. Co., 108 Main St., Fairmount, Ind.

STA-BRIGHT—See Robertson Machine & Foundry Co.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STANDARD Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Matchless."

STANDARD Varnish Works (Elm Park), Port Richmond, N. Y. "A B C Reviver."

STAR—See Alder Chemical Co.

SUN-GLO—See Lord Polish Co.

SUTHERLAND & Co., P., 282 Milk St., Boston, Mass.

SUYDAM Co., M. B., 61st & Butler Sts., Pittsburg, Pa. "Monarch," "Majestic."

TAROF—See Cooper & Osterhout.

THREE X—See Bobrick Chemical Co.

THUMB, E. W., 872 Orleans St., Chicago, Ill.

TILCO Co., 814-20 S. Vandeventer Ave., St. Louis, Mo.

TOBEY Furniture Co., Wabash Ave. & Washington St., Chicago, Ill.

U-AUTO-VARNISH Co., 345 The Arcade, Cleveland, O.

U-SAV-YOUR Mfg. Co., 51 Perkins St., Warren, Mass.

ULRICH & Co., E. North & Rose Sts., Buffalo, N. Y. "A-O-K."

UNCLE HIRAM'S—See New Method Varnish Co.

UNO Mfg. Co., Royal Ins. Bldg., Chicago, Ill. "S. & B."

UTILITY—See Poughkeepsie Utilities Corp.

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VANITY Mfg. Co., 90-93 S. Park Ave., Buffalo, N. Y.

VAR-NOIL—See Le Doyen, Frank J.

VARNI-SHINE Co., Columbus, O.

VARNISHINE—See Lee Mfg. & Chemical Co.

VICTROLENE—See Dorsey Mfg. Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WAXIT Mfg. Co., 2424-26 University Ave., S. E., Minneapolis, Minn.

WAXOL—See Reid Mfg. Co.

WEINBERG & Co., J. H., 128 Maiden Lane, New York, N. Y. "Marathon."

WESTFIELD Chemical Co., Westfield, Mass. "Zit."

WHITE & Bagley Co., Worcester, Mass. "Oilsum."
(See page 611.)

WONDER-MIST Co., 1789 Broadway, New York, N. Y.
(See page 397.)

WONDER WORKER—See Hall-Thompson Co

WOOD Auto Polishing Co., 81 Allen Ave., Galesburg, Ill.

XLNT Mfg. Co., 209 Woodward St., Cincinnati, O.
(See page 671.)

ZINSSER & Co., W., 195 William St., New York, N. Y.

ZIT—See Westfield Chemical Co.

METAL POLISHES

A-1—See Rath Co.

A-O-K—See Ulrich & Co.

ACME Polish Co., 71 S. 12th St., Pittsburg, Pa. "Ayrolite."

ADAMS & Elting Co., 718-26 Washington Blvd., Chicago, Ill. "Shinite."

ADVANCE Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.

AJAX—See Crowell Chemical Co.

AMALIE—See Sonneborn Sons.

AMERICAN—See Harvey Chemical Co.

AMERICAN Metal Polish Co., 89 Winslow Ave., W., West Somerville, Mass. "North Star," "Meyers."

AMERICAN Oil & Disinfectant Co., 196 Water St., New York, N. Y. "Sparrow."

AMERICUS Products Mfg. Co., Detroit, Mich.

ANCHOR—See Hoffman Paint & Varnish Co.

APEX POLISHINE—See Millers Sons Co.

ARCO SPOTZOFF—See Atlantic Refining Co.

ARMIGER Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."

ARMY & NAVY—See Grady Mfg. Co.

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
(See page 179.)

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Shine-All."

ATLANTIC Refining Co., Euclid Ave. & E. 65th St., Cleveland, O. "Arco Spotzoff."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Sunshine."
(See page 177.)

AUTO Bright Mfg. Co., 210 Main St., Buffalo, N. Y.

AYROLITE—See Acme Polish Co.

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

BAILEYS—See Crown Mfg. Co.

BAR-NIC—See Barcy-Nicholson Co.

BARCY-NICHOLSON Co 841-43 Fort St., W., Detroit, Mich. "Bar-Nic."

Complete Index to Classification appears on Pages 8 to 27.

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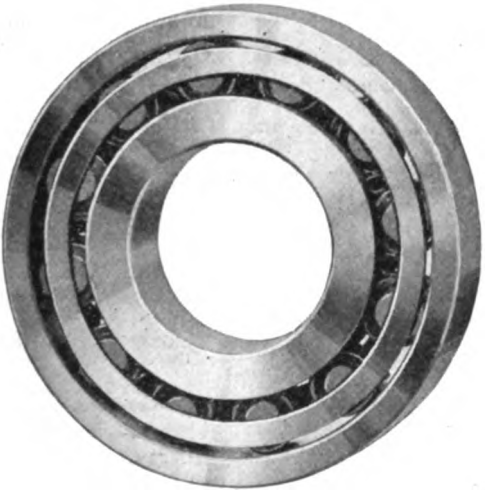
The Graham Roller Bearing Co.

of Coudersport, Pa.

Wishes to announce that active operations have already commenced in their new plant for the manufacture of Roller Bearings of the straight roller type.



These Bearings will be interchangeable with all Ball and roller-bearing sizes. Of high carbon alloy steel of the very best quality. Accuracy equal to the very best manufactured American or foreign bearing.

The Graham Roller Bearing Co.

Coudersport, Pa.

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POLISHES (Continued)

METAL POLISHES (Continued)

BAUM'S Castorine Co., 104 N. George St., Rome, N. Y.

BEACON—See Cincinnati Oil Works Co.

BELL—See Reid Mfg. Co.

BELL Oil Co., 53 E. Ferry St., St. Louis, Mo. "Liberty Bell."

BEN Hur Metal Polish Co., 105 E. Market St., Crawfordsville, Ind.

BERTRAMS—See New Jersey Paint Works.

BLAIR Co., J. T., Nashville, Tenn. "J. T."

BLACK Silk Stove Polish Works, Sterling, Ill.

BLUE RIBBON—See International Metal Polish Co.

BLUE Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Peerless," "Kantburn," "Premium."

BOBRICK Chemical Co., 111-17 S. Garey St., Los Angeles, Cal. "Radium," "E. Z. Q."

BOWMAN-EDSON Co., M. K., 64 Dey St., New York, N. Y. "Edsonia." (See page 693.)

BOYER Chemical Laboratory Co., 11 W. Austin Ave., Chicago, Ill.

BRASS-NU—See Nu-Back Mfg. Co.

BRETT Dimmer Co., A. H., Mason City, Ia. "C. C."

BRIDGEPORT Wood Finishing Co., New Milford, Conn. "Metalshine."

BRIGGS & Co., John, 45 Purchase St., Boston Mass. "Hub."

BRITE-LITE—See Pure Oil Co.

BUFFALO—See Ulrich & Co.

BULLY—See Weinberg & Co.

BURNISHINE—See Paul & Co.

C. C.—See Brett Dimmer Co.

CALLERY & Co. W. W., 183 36th St., Pittsburg, Pa. "Winterton."

CAMPBELL Glass & Paint Co., St. Louis, Mo. "Star."

CAR-BRITE—See Lord Polish Co.

CENTURY—See Davey & Co.

CHEMICAL Supply Co., E. 93d St., S. E. & Erie R. R., Cleveland, O.

CHICAGO White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill.

CINCINNATI Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Beacon."

CLEANER Mfg. Co., 2842 Olive St., St. Louis, Mo. "Polishine."

CLEANOLA Co., Fulton Bldg., Pittsburg, Pa. "Spe-De-Shyne."

COLGAN Mfg. & Supply Co., 42 South St., New York, N. Y. "Peerless." "Crescent."

COLUMBIA—See Stevens, Frederic B.

CORLISS Supply Co., 1906 Olive St., St. Louis, Mo.

CRESCENT—See Colgan Mfg. & Supply Co.

CROWELL Chemical Co., 9 Oxford Terrace, Beverly, Mass. "Oxford," "Ajax."

CROWN Mfg. Co., Indianapolis, Ind. "Baileys."

CURRY Bros. Oil Co., 253-55 Franklin St., Boston, Mass. "Superba."

DAVEY & Co., 2600 Grand Ave., Chicago, Ill. "Puritan," "Century."

DAY Mfg. Co., S. A., 25 Demond St., Buffalo, N. Y. "Zircon."

DAYTON Polish Co. Bacon St., Dayton, O.

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

DIAMOND Polish Co., Brown Bldg., Washington, Pa.

DIAMOND Specialty Co., Indianapolis, Ind.

DIELECTRIC Mfg. Co., 224 S. Vandeventer Ave., St. Louis, Mo.

DOZIT—See Kirk Mfg. Co.

DRAGON—See Paul & Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie." (See pages 189 to 192.)

E. Z. Q.—See Bobrick Chemical Co.

EAGLE Oil & Supply Co., Boston, Mass. "Eagleine." (See page 827.)

EAGLEINE—See Eagle Oil & Supply Co.

EASYBRIGHT—See Stinson & Co.

EAVENSON & Sons, J., Delaware & Penn Sts., Camden, N. J. "Jesco."

EDSONIA—See Bowman-Edson Co.

ERICKA Mfg. Co., 222 Liberty St., Springfield, Mass. "Shineaul."

ESSEX Paint Works, Essex, Conn.

EVANS & Bro., 3514 Juniata St., St. Louis, Mo.

FAULTLESS—See Hawkeye Oil Co.

FEINER Chemical Mfg. Co., 233 Mill St., Springfield, Mass. "Rub-Less."

FIEBING Chemical Co., 238-40 Reed St., Milwaukee, Wis. "Lusterine."

FIREBALL Gas Tank & Illuminating Co., 5010 Delmar Blvd., St. Louis, Mo.

FLASH Chemical Co., Kendall Sq., Boston, Mass.

FRAZER Lubricator Co., 3921 Normal Ave., Chicago, Ill.

GARRATT-CALLAHAN Co., 37 S. Clinton St., Chicago, Ill.

GERMAN—See Sutherland & Co.

GLITTERSHINE—See Grady Mfg. Co.

GLOBE—See Raimes & Co.

GOLD MEDAL—See Hoffman Co.

GOLDEN GLITTER—See Grady Mfg. Co.

GOLDEN SCEPTRE—See Rath Mfg. Co.

GOLDEN STAR—See Morris Mfg. Co.

GOLDSHINE—See Van Tilburg Oil Co.

GRADY Mfg. Co., 250-56 Ely Ave., Long Island City, N. Y. "Glittershine," "Scouree," "Army & Navy," "Golden Glitter," "Summershine."

GREAT Western Oil Co., 3355 E. 37th St., Cleveland, O.

GUN Metal Finish Co., Main & Water Sts., Decatur, Ill.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker," "Nick-E-Lo." (See page 171.)

HARRAL Soap Co., 132-36 Havemeyer St., Brooklyn, N. Y. "Kleeneasy."

HARRIS Oil Co., A. W., 326 S. Water St., Providence, R. I. "Scouree."

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POLISHES (Continued)

METAL POLISHES (Continued)

HARVEY Chemical Co., 216 N. Fifth St., La Fayette, Ind. "American."

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HAZEN-BROWN CO., 430 Court St., Brockton, Mass.

HEANEY Mfg. Co., 164 State St., Boston, Mass.

HERCULES Chemical Works, 2138 W. Van Buren St., Chicago, Ill. "Non-Such," "Spra-On."

HIGHSHINE—See Rath Mfg. Co.

HINDS & Coen, 124-26 Pearl St., Boston, Mass. "Ruby-Rub."

HOFFMAN Co., Geo. Wm., 557 E. Washington St., Indianapolis, Ind. "U. S." "Gold Medal."

HOFFMAN Paint & Varnish Co., 3 Medford St., Boston, Mass. "Anchor."

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

HUB—See Briggs & Co.

IMPERIAL—See Rath Mfg. Co.

IMPERIAL Oil Co., 3124 Locust St., St. Louis, Mo. "Marvin."

INDIANAPOLIS Paint & Color Co., 113 W. Chesapeake St., Indianapolis, Ind. "Metal-Brite."

INTERNATIONAL Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

INTERSTATE Chemical Co., 12-20 Bayview Ave., Jersey City, N. J. "Key."

J. T.—See Blair Co.

JAPO—See Tilco Co.

JESCO—See Bavenson & Sons.

JEWEL—See Wadsworth-Howland Co.

JIFFY Specialty Co., McKeesport, Pa.

JOHNSTON Paint Co., R. F., Pearl & Main Sts., Cincinnati, O.

KANTBURN—See Blue Ribbon Mfg. Co.

KETTLER Brass Mfg. Co., 109 Fairview St., Houston, Tex. "Qck Work."

KEY—See Interstate Chemical Co.

KIRK Mfg. Co., 1522 Grand Ave., Kansas City, Mo. "Dozit."

KLEENEASY—See Harral Soap Co.

KOSMOS—See Mulliken Oil Co.

LEE Mfg. & Chemical Co., Wm. E., 622 Cypress Ave., Kansas City, Mo.

LIBERTY BELL—See Bell Oil Co.

LIGHTNING Flash Specialty Co., Harrison & Garrard Aves., Cincinnati, O.

LORD Polish Co., F. T., 37 Hovey Ave., Cambridge, Mass. "Lumino," "Car-Brite."

LUMINO—See Lord Polish Co.

LUSTERINE—See Fiebing Chemical Co.

McLEAN-JONES Oil & Supply Co., 40 Indian Wharf, Boston, Mass. "Nox-All."

MAGICLEAN—See Schmoeger, Frederic A.

MARATHON—See Weinberg & Co.

MARVIN—See Imperial Oil Co.

MATCHLESS Metal Polish Co., 149 Varick St., New York, N. Y. "Mexoline," "Tripoline."

MAXINE—See Rexine Co.

METAL-BRITE—See Indianapolis Paint & Color Co.

METALSHINE—See Bridgeport Wood Finishing Co.

MEXOLINE—See Matchless Metal Polish Co.

MEYERS—See American Metal Polish Co.

MILLER Co., Frank, 349-51 W. 26th St., New York, N. Y.

MILLERS Sons Co., A. D., Columbus & Preble Aves., Pittsburg, Pa. "Apex Polishine."

MOBO—See Stanley, John T.

MONARCH—See Suydam Co.

MOONSHINE—See Winn, Wm. R.

MOORE Oil Co., York St. & McLean Ave., Cincinnati, O. "Mooreshine."

MOORESHINE—See Moore Oil Co.

MORGAN Mfg. Co., John St., Newport, R. I.

MORRIS Mfg. Co., R. W., Gumbel Bldg., Kansas City, Mo. "Golden Star."

MOTOR Mica Mfg. Co., 1110 N. Clark St., Chicago, Ill. "Moscows."
(See page 823.)

MOSCOWS—See Motor Mica Mfg. Co.

MULLIKEN Oil Co., 200 Friend St., Boston, Mass. "Kosmos."

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NATIONAL Mfg. Co., 227 Portage St., Kalamazoo, Mich.

NATIONAL Oil & Supply Co., 130 Frelinghuysen Ave., Newark, N. J. "Viscos."

NATIONAL Valgrinok Co., 195 Church St., Newton, Mass. "Valgrinok."

NAY Chemical Co., Tom, Holden, Mo.

NEW Jersey Paint Works, Tremont & Wayne Sts., Jersey City, N. J. "Bertrams."

NEW-TONE Mfg. Co., 3336 Colorado Ave., Chicago, Ill. "Rayo."

NICK-E-LO—See Hall-Thompson Co.

NOBLE Refining Co., 706 Canal Rd., Cleveland, O.

NON-SUCH—See Hercules Chemical Works.

NORTH STAR—See American Metal Polish Co.

NORTHWESTERN Chemical Co., Marietta, O. "Pioneer."
(See pages 172 and 173.)

NOX-ALL—See McLean-Jones Oil & Supply Co.

NOXAL Polish Mfg. Co., 1238 Belmont Ave., Philadelphia, Pa.

NU-BACK Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Brass-Nu."

OROLO Mfg. Co. Eighth & Jefferson Sts., Louisville, Ky.

OSMACO—See Schlegel Mfg. Co.

OXFORD—See Crowell Chemical Co.

PANTHER—See B. A. T. Co.

PARKER Refining Co., 1307 W. 11th St., Cleveland, O.

PATTERSON Lubricating Co., 114 Broad St., Boston, Mass.

PAUL & Co., J. C., Chicago, Ill. "Burnishine," "Dragon."

PEERLESS—See Blue Ribbon Mfg. Co.

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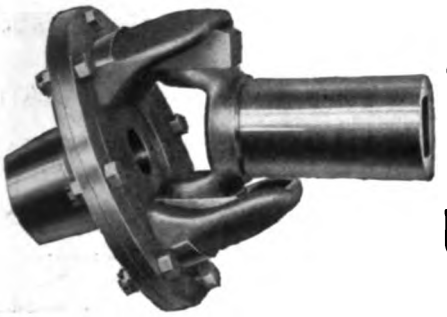

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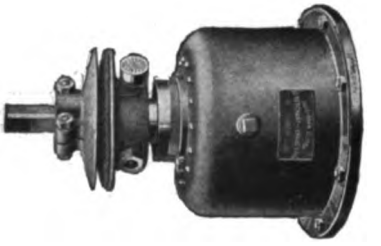

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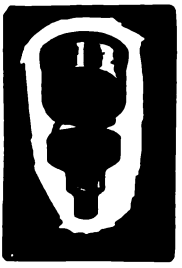

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POLISHES (Continued)

METAL POLISHES (Continued)

PEERLESS—See Colgan Mfg. & Supply Co.

PENN Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa. "Primus."

PERFECTION—See Warren Refining & Chemical Co.

PIONEER—See Northwestern Chemical Co.

PIONEER Mfg. Co., Harvard Ave. & E. 102d St., Cleveland, O. "Shino."

POLESHINE—See Cleaner Mfg. Co.

PREMIUM—See Blue Ribbon Mfg. Co.

PRIMUS—See Penn Petroleum & Supply Co.

PURE Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Brite-Lite."

PURITAN—See Davey & Co.

PURITAN Soap Co., 500 Exchange St., Rochester, N. Y.

QCK WORK—See Kettler Brass Mfg. Co.

RADIUM—See Bobrick Chemical Co.

RAIMES & Co., 50 Ferry St., New York, N. Y. "Globe."

RAPID Shine Products Co., St. Louis, Mo.

RATH Co., Chas. H., 53d & Broomall Sts., Philadelphia, Pa. "A-1."

RATH Mfg. Co., Hedley & Richmond Sts. (Frankford), Philadelphia, Pa. "Imperial," "Golden Sceptre," "Staraline," "Highshine," "Swiss."

RAYDO—See Ulrich & Co.

RAYO—See New-Tone Mfg. Co.

RED CROSS—See Robertson & Co.

REID Mfg. Co., W. W., 204 Milk St., Boston, Mass. "Bell," "Zip."

REX—See Armiger Chemical Co.

REXINE Co., Sheboygan, Wis. "Maxine." (See page 811.)

RIE-NIE—See Durkee-Atwood Co.

ROBERTSON & Co., 1141 W. Madison St., Chicago, Ill. "Red Cross."

ROGERS—See Detroit White Lead Works.

RUB-LESS—See Feiner Chemical Mfg. Co.

RUBY-RUB—See Hinds & Coon.

ST. LOUIS Surfacer & Paint Co., Arlington Ave. & Terminal Belt Line, St. Louis, Mo.

SCHLEGEL Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y. "Osmaco."

SCHMOEGER, Frederic A., Sterling, Ill. "Magiclean."

SCOUREE—See Grady Mfg. Co.

SCOUREE—See Harris Oil Co.

SHINAL—See Adams & Elting Co.

SHINE-ALL—See Arnstein, Geo. W.

SHINE-M-UP—See Simplex Auto Specialty Co.

SHINEAUL—See Ericka Mfg. Co.

SHINITE—See Adams & Elting Co.

SHINO—See Pioneer Mfg. Co.

SIMPLEX Auto Specialty Co., 738 Woodward Ave., Detroit, Mich. "Shine-m-up."

SLIKUP—See Arnold, N. B

SOLARINE Co., 153-55 N. Carpenter St., Chicago, Ill.

SOLSHINE Mfg. Co., 204 Milk St., Boston, Mass.

SONNEBORN Sons, L., 262 Pearl St., New York, N. Y. "Amalie."

SPARROW—See American Oil & Disinfectant Co.

SPE-DE-SHYNE—See Cleanola Co.

SPEARE'S Sons Co., Alden, 140 Sixth St., Boston, Mass.

SPRA-ON—See Hercules Chemical Works.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STANLEY, John T., 642 W. 30th St., New York, N. Y. "Mobo."

STAR—See Campbell Glass & Paint Co.

STARALINE—See Rath Mfg. Co.

STAY-BRIGHT Lacquer Co., 58 W. Washington St., Chicago, Ill.

STEVENS, Frederic B., Detroit, Mich. "Columbia." (See pages 759 and 760.)

STINSON & Co., B. F., 418-28 Niagara St., Buffalo, N. Y. "Easybright."

SUMMERSHINE—See Grady Mfg. Co.

SUNSHINE—See Atlas Auto Supply Co.

SUPERBA—See Curry Bros. Oil Co.

SUTHERLAND & Co., P., 232 Milk St., Boston, Mass. "German."

SUYDAM Co., M. B., 61st & Butler Sts., Pittsburg, Pa. "Monarch."

SWEET, Charles F., 247 State St., Hartford, Conn.

SWISS—See Rath Mfg. Co.

TILCO Co., 814-20 S. Vandeventer Ave., St. Louis, Mo. "Japo."

TRAFTON Co., F. M., 176 Federal St., Boston, Mass.

TRIPOLINE—See Matchless Metal Polish Co.

ULRICH & Co., E. North & Rose Sts., Buffalo, N. Y. "A-O-K," "Buffalo," "Raydo."

UKO—See Utility Co.

U. S.—See Hoffman Co.

UNO Mfg. Co., Royal Ins. Bldg., Chicago, Ill.

UTILITY Co., 630 W. 44th St., New York, N. Y. "Uko."

VALGRINOK—See National Valgrinok Co.

VAN CLEEF Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VAN Tilburg Oil Co., 3424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

VANITY Mfg. Co., 90-98 S. Park Ave., Buffalo, N. Y.

VISCOS—See National Oil & Supply Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WANG—See Van Tilburg Oil Co.

WARREN Refining & Chemical Co., Cleveland, O. "Perfection."

WEINBERG & Co., J. H., 123 Maiden Lane, New York, N. Y. "Bully," "Marathon."

WHIZ—See Hollingshead Co.

WICO—See Williams Mfg. Co.

WILLIAMS Mfg. Co., Columbus, O. "Wico." (See page 467.)

WINN, Wm. R., 143 Maiden Lane, New York, N. Y. "Moonshine."

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POLISHERS (Continued)

METAL POLISHES (Continued)

WINTERTON—See Callery & Co.

WONDER WORKER—See Hall-Thompson Co.

YALE—See Rostand Mfg. Co.

YOUNG, Orlando W., 130 Sherman Ave., Newark, N. J.

ZIP—See Reid Mfg. Co.

ZIRCON—See Day Mfg. Co.

PORCELAIN

ARTISTIC Porcelain Co., Trenton, N. J.

EMPIRE China Works, 142-56 Green St., Brooklyn, N. Y.

FRENCHTOWN Porcelain Co., Trenton, N. J.
(See page 409.)

GENERAL Porcelain Co., East Liverpool, O.

HARTFORD Faience Co., Hartford, Conn.

IMPERIAL Porcelain Works, Mulberry St. & New York Ave., Trenton, N. J.

J-D—See Jeffery-DeWitt Co.

JEFFERY-DEWITT Co., 54 Butler Ave., Detroit, Mich. "J-D."
(See page 409.)

NATIONAL Porcelain Co., Trenton, N. J.

PRIMERS

GASOLINE ENGINE PRIMERS

(See Heaters, Mixture; also Starters)

BAILEY Co., Wm. J., 401-07 Mulberry St., Newark, N. J. "C. B."

BOSTON Starter & Specialty Co., 188 Columbus Ave., Boston, Mass.

BUCKEYE—See Central Brass & Fixture Co.

BULLOCK Engine Co., 142 N. Wabash Ave., Chicago, Ill. "Irish."

C. B.—See Bailey Co.

CARBOGAS Co., Gardner Bldg., Toledo, O.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Spingfield, O. "Buckeye."

CHANEY Co., L. F., 508 Boler St., Springfield, O.

CHI-FAU-CO—See Chicago Faucet Co.

CHICAGO Faucet Co., 2712 N. Crawford Ave., Chicago, Ill. "Chi-Fau-Co."

COLONIAL Auto & Supply Co., 101 W. 66th St., New York, N. Y.

CONSOLIDATED Gas & Electric Co., 552 W. Lake St., Chicago, Ill. "Economy."

CRONE, F. G., 334 Genesee St., Buffalo, N. Y.

ECONOMY—See Consolidated Gas & Electric Co.

ENGINEERING Equipment Co., State Life Bldg., Indianapolis, Ind.

GILSON Motor Starting Co., 940 N. Pennsylvania St., Indianapolis, Ind.

HAGSTROM Bros. Mfg. Co., Lindsborg, Kans.

HILL-STAGE Co., 604 Jackson St., Anderson, Ind.

IDEAL Brass Works, Tenth & Canal Sts., Indianapolis, Ind.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. "Prime-ur."
(See page 869.)

INJEX—See Reflex Ignition Co.

IRISH—See Bullock Engine Co.

JIFFY Jack Co., 1104 Prospect Ave., S. E., Cleveland, O.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

NATIONAL Mfg. Co., 227 Portage St., Kalamazoo, Mich.

PERKINS Appliance Co., 539 Worthington St., Springfield, Mass. "Victory."
(See page 709.)

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind.
(See page 553.)

PRIME-UR—See Imperial Brass Mfg. Co.

REFLEX Ignition Co., 1710 Payne Ave., Cleveland, O. "Injex."
(See page 675.)

SPARGO, J. S., 755 Boylston St., Boston, Mass.

VICTORY—See Perkins Appliance Co.

WELD Mfg. Co., North Chatham, Mass.

PROPS

CAR PROPS OR SUPPORTS

(See Jacks, Lifting)

PROTECTORS

SLEEVE AND CUFF PROTECTORS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

NIAGARA Fabric Mfg. Co., 524 W. 50th St., New York, N. Y.

TIRE PROTECTORS

(See Treads, Detachable; also Shoes, Inner Tire)

PULLEYS

PRESSED STEEL FAN PULLEYS

MICHIGAN Engine Valve Co., 115-17 Columbia St., West, Detroit, Mich.
(See page 549.)

PULLEYS AND SHEAVES

(See Sheaves and Pulleys)

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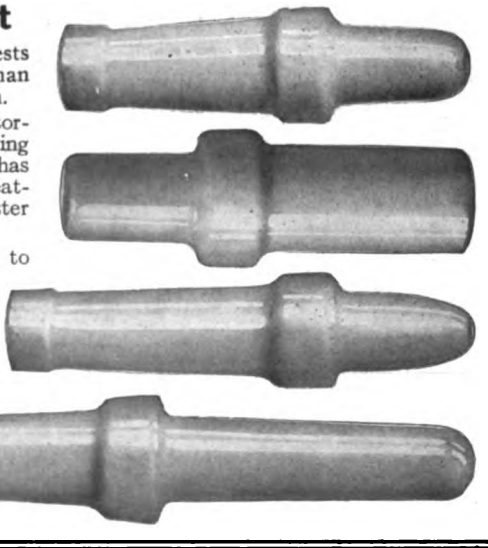

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PUMPS

ENGINE DRIVEN TIRE PUMPS

A.B.C.—See Artizan Brass Co.

ADVANCE Machinery Co., Toledo, O. (See page 609.)

ARTIZAN Brass Co., 230 N. Jefferson St., Chicago, Ill. "A.B.C."

AUTO Air Appliance Co., 501 E. Preston St., Baltimore, Md.

B. B.—See Herz & Co.

BAY State Pump Co., 275 Congress St., Boston, Mass. "Crane." (See page 633.)

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CHAMPION, F. M., 236 Elizabeth St., Utica, N. Y.

CHICAGO Tire Pump Co., 20 E. Jackson Blvd., Chicago, Ill. (See page 413.)

COLSTAD Sales Co., 43 Binford St., Boston, Mass.

CRANE—See Bay State Pump Co.

DETROIT Accessories Corp., Detroit, Mich. (See page 415.)

E-Z—See Wheaton & Co.

GENERAL Utility Co., 1320-30 Ogden St., Philadelphia, Pa.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. "Master." (See page 383.)

HERZ & Co., 245 W. 55th St., New York, N. Y. "B. B.," "Tandem." (See page 389.)

HILL Pump Valve Co., Archer Ave., Canal & 23d Sts., Chicago, Ill. "Utility."

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. "Juleco." (See pages 415 and 799.)

JULECO—See Judd & Leland Mfg. Co.

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

KENMORE Mfg. Co., 15 N. Crawford Ave., Chicago, Ill.

LIPMAN Air Appliance Co., 199 Pleasant St., Beloit, Wis.

M. & L.—See McCarrell & Hawley.

MANZEL Bros. Co., 320 Babcock St., Buffalo, N. Y.

MASTER—See Hartford Machine Screw Co.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill. (See page 735.)

MEDINA Machine Co., Medina, O.

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

OGDEN Fibre Gear & Tire Co., Columbus, Ind.

P. T. C.—See Pacific Tucking & Mfg. Co.

PACIFIC Tucking & Mfg. Co., 471-73 18th St., Brooklyn, N. Y. "P.T.C."

R-F—See Rauber-Fien Mfg. Co.

RACINE Engine & Machinery Co., 1620 Racine St., Racine, Wis. "Two Minute."

RAUBER-FIEN Mfg. Co., 183-87 N. Water St., Rochester, N. Y. "R-F." (See page 415.)

ROLL-ON—See V Air Valve & Mfg. Co.

SMITH, Irvin C., 855 S. Los Angeles St., Los Angeles, Cal.

STEWART-WARNER Speedometer Corp., Chicago, Ill. (See page 461.)

TANDEM—See Herz & Co.

TAYLOR Mfg. Co., 977 Jefferson St., Detroit, Mich.

TWO MINUTE—See Racine Engine & Machinery Co.

UNIVERSAL Air Equipment Co., 49 S. Delaware St., Indianapolis, Ind.

UTILITY—See Hill Pump Valve Co.

V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo. "Roll-On."

WHEATON & Co., C. M. Sunbury, Ohio. "E-Z."

FOOT TIRE PUMPS

SCHLESINGER-REDBURN Corp., 1834 Broadway, New York, N. Y. "Twombly." (See pages 411 and 412.)

TWOMBLY—See Schlesinger-Redburn Corp.

HAND TIRE PUMPS

AEOLUS—See Bridgeport Brass Co.

ANTHONY Co., 138 West Ave., Long Island City, N. Y.

APEX Electric Mfg. Co., 1410 W. 59th St., Chicago, Ill. "Yankee."

ATLAS—See Bridgeport Brass Co.

BELL Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.

BISHOP-BABCOCK-BECKER Co., E. 49th St. & Hamilton Ave., Cleveland, O.

BLIZZARD—See Bridgeport Brass Co.

BOSS—See Cox Brass Mfg. Co.

BRIDGEPORT Brass Co., Bridgeport, Conn. "Stapley," "Æolus," "Atlas," "Windjammer," "Crown."

BRISK Blast Mfg. Co., 1515-27 N. 25th St., St. Louis, Mo.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CARVER—See Osborne & Stephenson Mfg. Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Springfield."

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

COE-STAPLEY Mfg. Co., 1565 Railroad Ave., Bridgeport, Conn. "Rex," "Little Giant."

COLUMBIA—See Judd & Leland Mfg. Co.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Boss," "Handy," "Reliable." (See page 717.)

CROWN—See Bridgeport Brass Co.

CYCLONE—See Judd & Leland Mfg. Co.

DIXIE—See Sunderland Mfg. Co.

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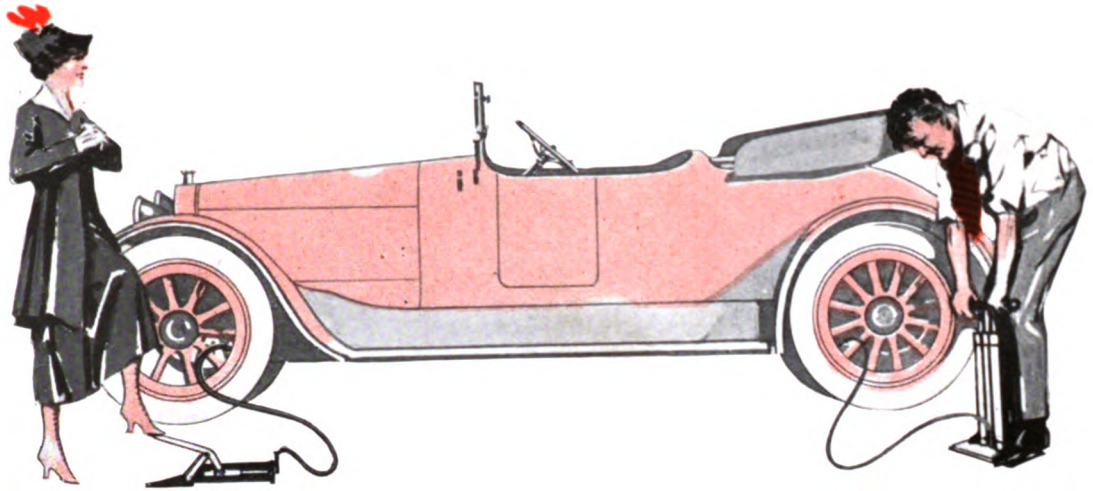
"Makes Hard Work A Pleasure"



The New Way

She Smiles

The Old Way

He Grumbles

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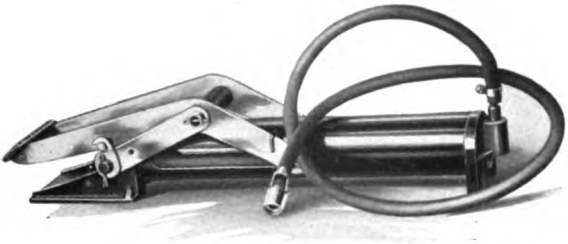


CLOSED 17" x 3" x 3"

Preparedness—Twombly Tire Foot Pump
Progressiveness—Twombly Tire Foot Pump

The Twombly Tire Foot-Pump is the immediate and positive successor of every hand pump on the market. We now have orders for 250,000—quarter of a million—pumps and our production capacity is equal to the enormous demand.

The back breaking, nerve racking, energy wasting hand pump is doomed and with it goes the stooping, sweating and cussing which invariably accompanied its use.

WITH A TWOMBLY TIRE FOOT-PUMP

you can inflate the largest tire to more than standard pressure in a few minutes without exertion.

The Twombly Tire Foot-Pump sells for slightly less than a good hand pump.

To the trade we give an extremely liberal discount which is made possible by our immense production.

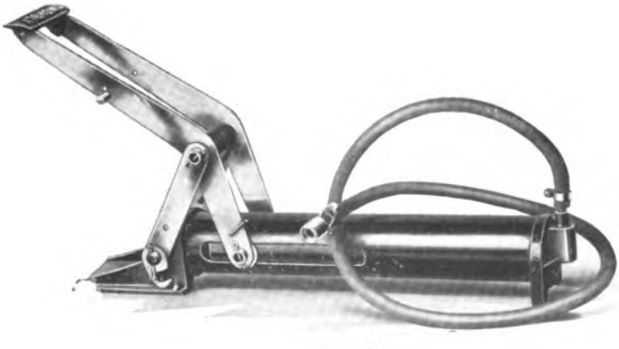
This is an age of Preparedness and Progressiveness. Grasp your opportunity and send in your order for a large number of these pumps.

COMPACT STRONG SIMPLE – FULLY GUARANTEED

With hose and quick adjustable locking connection, list price $4.50.

THE SCHLESINGER-REDBURN CORP.

1834 Broadway New York City



OPEN

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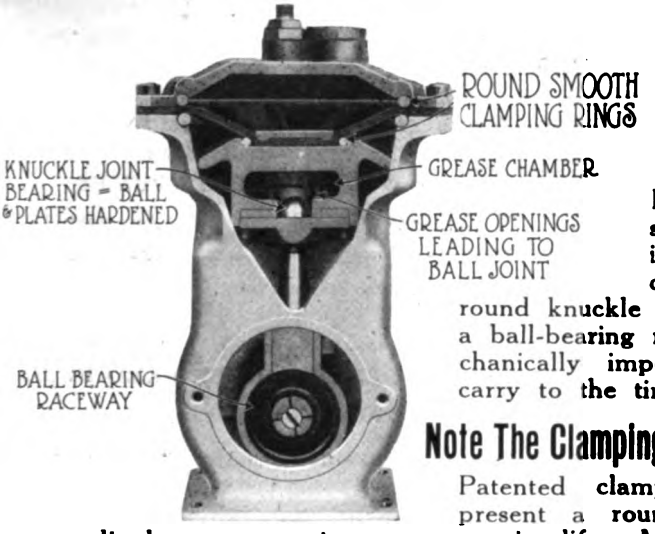


Simplex Tire Pump

Eliminates the usual splash system of oiling by using a specially deesigned round knuckle joint, together with a ball-bearing raceway. It is mechanically impossible for oil to carry to the tire.

Note The Clamping Ring Construction

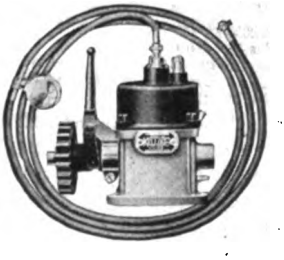
Patented clamping rings always present a round surface to the pump diaphragm—ensuring utmost service life. Many other exclusive features make the SIMPLEX Pump most desirable and economical to use—and easiest to sell. **Write for full details and particulars.**

CHICAGO TIRE PUMP COMPANY

20 E. JACKSON BOULEVARD, CHICAGO

KELLOGG Engine Driven Tire Pump

Furnished with fittings for practically every make and model of car



They are used and recommended exclusively by practically all the better Motor Car Manufacturers as regular or special equipment.

We guarantee no oil spray with the air

Selling Kellogg Pumps is a money-making proposition. Send for literature and prices.

$15.00 for most cars.
$10.00 for Dodge, Chevrolet, Overland 75, Grant Six
$8.50 for the Ford.

KELLOGG MANUFACTURING CO.

ROCHESTER, N. Y.

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PUMPS (Continued)

HAND TIRE PUMPS (Continued)

EUREKA—See Judd & Leland Mfg. Co.

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

GENERATOR Valve Co., 294-96 Taaffe Pl., Brooklyn, N. Y. "James."

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y.

GOULDS Mfg. Co., 240 Fall St., Seneca Falls, N. Y.

HANDY—See Cox Brass Mfg. Co.

HANEY & Co., J. H., Hastings, Neb. "Rose."

HERCULES—See Sunderland Mfg. Co.

HILL—See Judd & Leland Mfg. Co.

HOWELL Co., W. H., Geneva, Ill. "Jensen."

IDEAL—See Noera Mfg. Co.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. "Wixom." (See page 869.)

JAMES—See Generator Valve Co.

JENSEN—See Howell Co.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. "Eureka," "Columbia," "Tornado," "Cyclone," "Hill," "Victor." (See pages 415 and 799.)

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

LITTLE GIANT—See Coe-Stapley Mfg. Co.

MARVEL—See St. Charles Specialty Mfg. Co.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill. "Skinner." (See page 735.)

NOERA Mfg. Co., 21-97 Griggs St., Waterbury, Conn. "Red Devil," "Ideal," "Waterbury."

OSBORNE & Stephenson Mfg. Co., Plainville, Conn. "Carver." (See page 709.)

PITNER—See Sunderland Mfg. Co.

RED DEVIL—See Noera Mfg. Co.

RELIABLE—See Cox Brass Mfg. Co.

REX—See Coe-Stapley Mfg. Co.

ROSE—See Haney & Co.

SHAWVER Co., rear 81 W. Pleasant St., Springfield, O. "Springfield."

SKINNER—See Mayo Mfg. Co.

SPRINGFIELD—See Central Brass & Fixture Co.

SPRINGFIELD—See Shawver Co.

STAPLEY—See Bridgeport Brass Co.

STEVENS, C. S., 680 W. Main St., New Britain, Conn.

STOCKER Mfg. Co., 90 E. Woodbridge St., Detroit, Mich.

SUNDERLAND Mfg. Co., 61 E. 24th St., Chicago, Ill. "Hercules," "Thor," "Pitner," "Dixie."

THOR—See Sunderland Mfg. Co.

TORNADO—See Judd & Leland Mfg. Co.

TURNER Brass Works, Sycamore, Ill.

VICTOR—See Judd & Leland Mfg. Co.

WATERBURY—See Noera Mfg. Co.

WINDJAMMER—See Bridgeport Brass Co.

WIXON—See Imperial Brass Mfg. Co.

YANKEE—See Apex Electric Mfg. Co.

OIL PUMPS

(See Lubricators)

STEAM AIR PUMPS

AMERICAN Steam Pump Co., Battle Creek, Mich. "Marsh."

MARSH—See American Steam Pump Co.

UNION Steam Pump Co., Battle Creek, Mich.

STEAM BOILER FEED PUMPS

AMERICAN Steam Pump Co., Battle Creek, Mich. "Marsh."

MARSH—See American Steam Pump Co.

UNION Steam Pump Co., Battle Creek, Mich.

WATER CIRCULATING PUMPS

ATLAS Brass Foundry Co., 980-90 S. Front St., Columbus, O.

DOEHLER Die-Casting Co., Court & Ninth Sts., Brooklyn, N. Y. (See page 143.)

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

LEE Co., Wm. O., Port Huron, Mich.

LIPMAN Mfg. Co., 211 Pleasant St., Beloit, Wis.

LOBEE Pump & Machinery Co., 111-19 Dearborn St., Buffalo, N. Y.

OBERDORFER Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

OTTUMWA-MOLINE Engine & Pump Co., Ottumwa, Ia.

SPARKS-WITHINGTON Co., Jackson, Mich.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

PURIFIERS

ACETYLENE GAS PURIFIERS

TINKMAN Mfg. Co., Pierce City, Mo.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

PUSHES

FOOT PUSHES

(For ringing electric bells)

ROUSSEAU, David, Ossining, N. Y.

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GEARLESS
DETROIT
MOTOR-DRIVEN
TIRE-PUMP
PATENTED AUG. 24, 1915

DIRECT DRIVEN FROM MOTOR CRANK-SHAFT

No Tools—No Gears—No Brackets
Carried in tool-box, on or off in 30 seconds

Only 7 inches high, weighs 4½ pounds. More convenient to carry than a hand-pump and does the work in 3 or 4 minutes.

Agents and dealers everywhere find quick sales and good profits for this compact, convenient, powerful pump.

$8.75

COMPLETE WITH TUBE and GAUGE

Detroit Accessories Corporation
975 Woodward Avenue, Detroit, Mich.

R-F Power Driven Tire Pump

SPECIFICATIONS:

Cylinder, piston and crank case, grey iron. Bronze eccentric strap, steel crosshead. Forged steel camshaft. Piston fitted with three 9/64" lap-joint ground rings, spaced ⅛" apart.

Diameter of piston, 2⅛". Length of stroke, 1⅛". Length of shaft bearings, 1⅛" each. Splash system of lubrication. Weight complete, with gear and shifter, 6½ lb. Height over all, 6½". Hole and shaft centers, S. A. E. Standard.

Fittings for the following 1916 and 1917 cars: Buick, Chandler, Chalmers, Hudson, Paige, Studebaker, Overland, Oldsmobile.

$15.00

RAUBER-FIEN MANUFACTURING CO., Inc.
183-187 No. Water St., Rochester, N. Y.

The manufacturing principle that has made our new plant necessary:
Remember that human life depends upon the quality of your workmanship.

The high standards of quality set by us have necessitated the erection of a new plant, which is modern in every respect and which has doubled our capacity.

With improved manufacturing methods, insuring safety to the automobile user, we shall continue to manufacture the well known line of "S & W" standard automobile parts.

Safety Steering Reaches in All Standard Sizes for Pleasure Cars and Commercial Vehicles. Used as standard equipment by the largest producers of American Motor Cars.

Standard Torque Assemblies For All Cars

The Schweppe & Wilt Mfg. Co., Detroit, Mich.

The VICTOR a HALF a MINUTE PUMP

VICTOR
Trade Mark Reg.
WILL INFLATE a TIRE in ONE-THIRD THE number of STROKES of any Competitive Pump.
Its METALLIC TANNED PACKINGS will wear forever and are guaranteed.
REMEMBER
No Pump is *STRONGER* than its *PACKINGS*.

Judd & Leland Mfg. Co.
Clifton Springs, N. Y.

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PUTTY

ACME White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

BELKNAP, McSherry & Moran Co., E. S., 5 Ainslie St., Brooklyn, N. Y.

BRIGGS & Co., John, 45 Purchase St., Boston, Mass.

CHICAGO White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill.

DEVOE & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

FELTON, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa.

FRENCH & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

LUCAS & Co., John, 322-30 Race St., Philadelphia, Pa.

WILHELM Co., A., Third & Berr Sts., Reading, Pa.

RACES

BALL RACES

(See Cups, Ball)

RACKS

HAT RACKS

(See also Hangers, Hat)

BRIDGEPORT Coach Lace Co., 1731-37 Broadway, New York, N. Y.

COLUMBIA—See Horstmann Co.

HORSTMANN Co., Wm. H., Fifth & Cherry Sts., Philadelphia, Pa. "Columbia."

SCHLEGEL Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.

TRUNK RACKS

CONNECTICUT Steel & Wire Co., 57-61 Allyn St., Hartford, Conn. "Standard."

DURAND-FERRY Mfg. Co., National Life Bldg., Chicago, Ill.

HIGHTON & Sons Co., Wm., Nashua, N. H.

GRAY, Jr., Niel, Oswego, N. Y.

MASCO—See Milwaukee Auto Specialty Co.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

NOONAN Tool & Machine Works, 130-36 St. James St., Rome, N. Y.

REED Co., 390 Main St., Mayfield, Cal.

REESE Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

STANDARD—See Connecticut Steel & Wire Co.

RADIATORS

WATER COOLERS OR RADIATORS

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

AUTO Radiator Mfg. Co., 764-66 W. Van Buren St., Chicago, Ill. (See page 791.)

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

BUSH Mfg. Co., Hartford, Conn. (See page 407.)

CANDLER Radiator Co., Detroit, Mich. (See page 423.)

EL ARCO Radiator Co., West End Ave. & 64th St., New York, N. Y.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

EUREKA Auto Parts Mfg. Co., 1915-17 Pine St., St. Louis, Mo.

FEDDERS Mfg. Co., Buffalo, N. Y. (See page 425.)

G & O Mfg. Co., New Haven, Conn. (See page 789.)

GOETZ Co., 1802 Clybourn Ave., Chicago, Ill

HARRISON Mfg. Co., Lockport, N. Y. (See page 815.)

IDEAL Sheet Metal Works, 28th St. & Michigan Ave., Chicago, Ill. (See page 633.)

JAMESTOWN Car Parts Mfg. Co., Jamestown, N. Y. (See page 719.)

KELLS Mfg. Co., W. J., 521-35 W. 45th St., New York, N. Y. (See page 261.)

LIVINGSTON Radiator & Mfg. Co., 311 W. 75th St., New York, N. Y. (See page 631.)

LONG Mfg. Co., Detroit, Mich (See page 421.)

McCORD Mfg. Co., Detroit, Mich. (See pages 418 and 419.)

MAYO Radiator Co., New Haven, Conn.

METALLIC Shell & Tube Co., 127-29 Valley St., East Providence, R. I.

NATIONAL Can Co., Detroit, Mich. (See page 629.)

NATIONAL Radiator Co., 846 S. Canal St., Chicago, Ill.

PERFEX Radiator Co., Racine, Wis.

ROME-TURNEY Radiator Co., Rome, N. Y. (See page 423.)

SHOTWELL-HOBART-JOHNSON Co., 712-22 Ontario Ave., N., Minneapolis, Minn.

SPARKS-WITHINGTON Co., Jackson, Mich.

TAKE-APART-RADIATOR Co., 804 E. Washington St., Greensburg, Ind. "T-A-R-Co."

T-A-R-CO—See Take-Apart-Radiator Co.

TODD Mfg. Co., 320-24 Mary Pl., Minneapolis, Minn.

WISCONSIN Automobile Radiator Co., North Milwaukee, Wis.

WRIGHT Cooler & Hood Mfg. Co., 1253-55 S. Michigan Ave., Chicago, Ill. (See page 265.)

RAILS

ROBE OR COAT RAILS

AETNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ALLEN Fire Department Supply Co., Providence, R. I.

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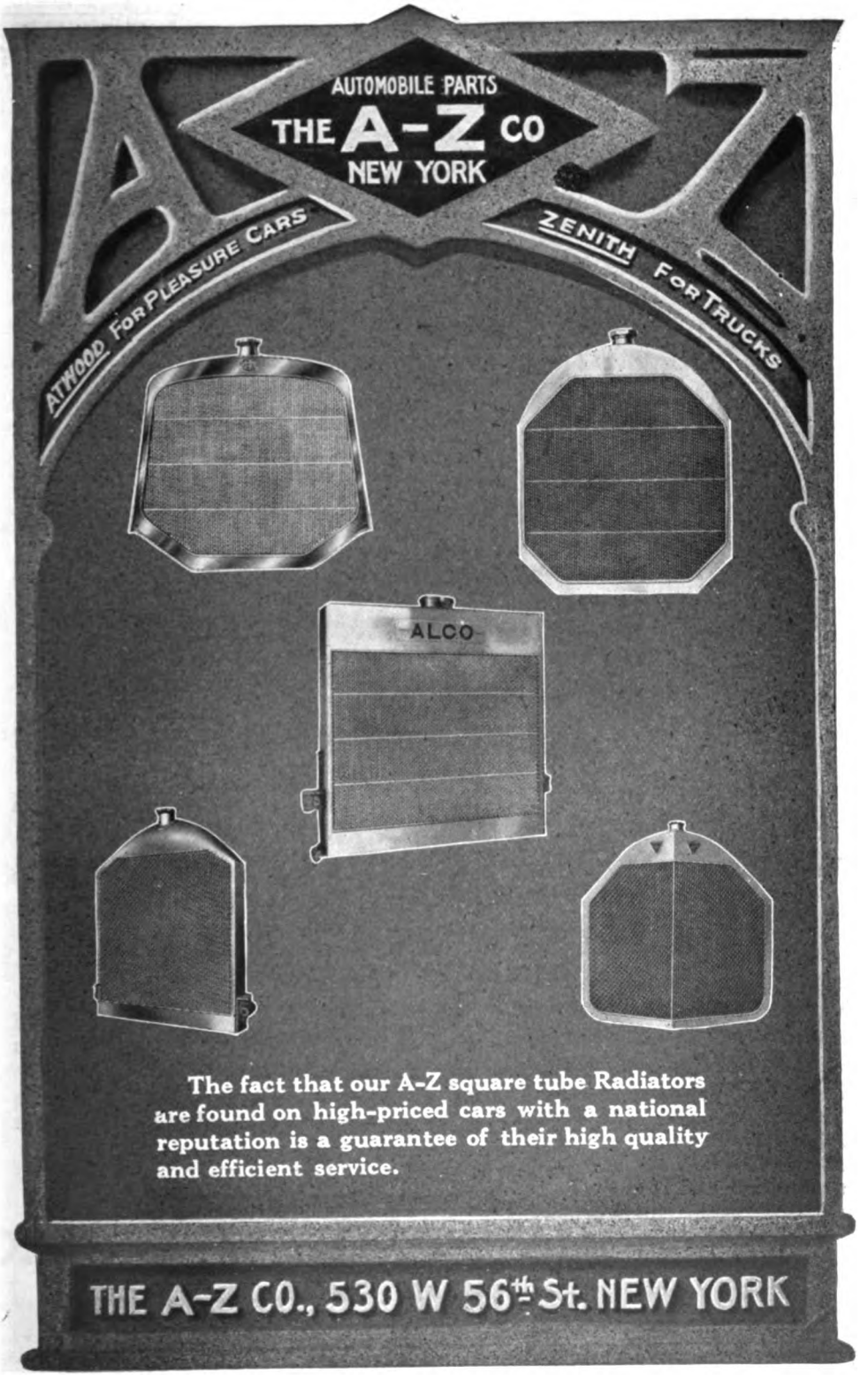

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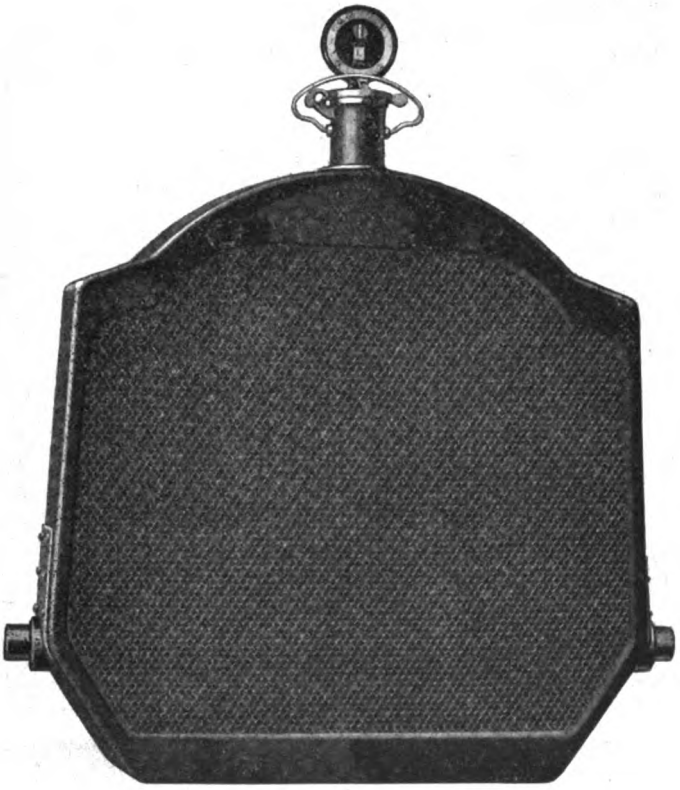

Excellence IN RADIATOR DESIGN WORKMANSHIP & SERVICE.

Combine with originality and production capacity to establish

McCord Radiators

as the preferred type on leading pleasure cars, trucks and tractors. A new plant, recently acquired, almost doubles our capacity enabling us to predict that 1916 production will not be less than 1,000 radiators per day.

We illustrate above one of the many high-class models we are building—the Hexagon Cellular radiator which, for real efficiency combined with light weight and sturdiness, cannot be equaled.

An experienced and thoroughly efficient Engineering Department is always at your service. Write us.

McCORD MANUFACT

DETROIT

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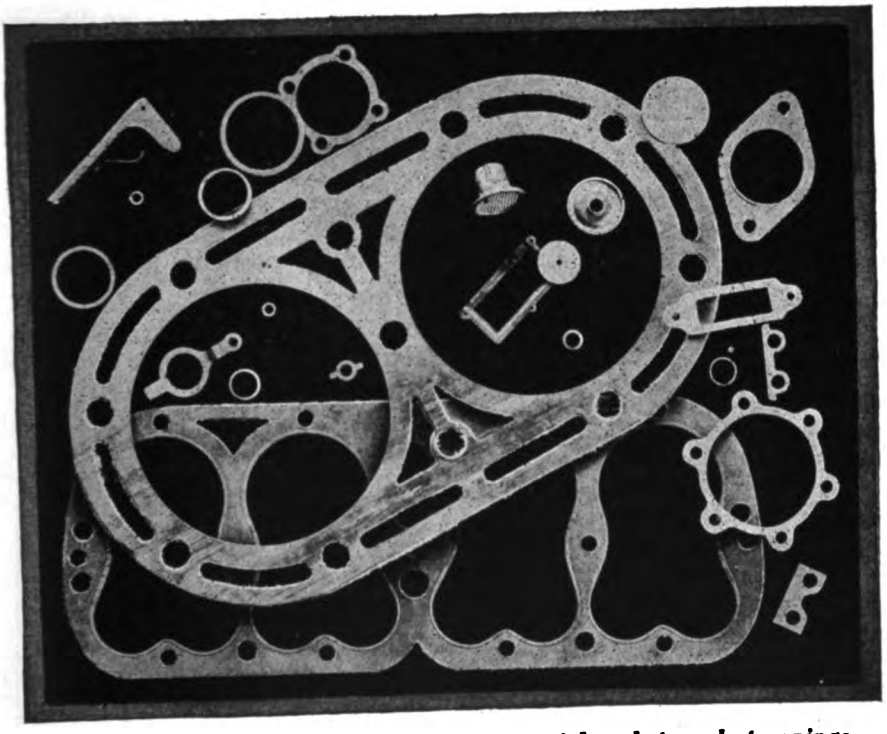

We illustrate above a limited variety of special gaskets and stampings made in our Gasket plant.

McKIM Copper Asbestos Gaskets & Meta Stampings

—are standard for all gasolene motor flanges. They are made in immense quantities from the best materials and by the most improved methods. The method of manufacturing forms a gasket of long life. We carry on hand at all times an actual minimum stock of over half a million Gaskets of assorted sizes. We can assure you of prompt shipment and the lowest prices. You can select from our standard stock list—or, if your requirements are special, send us your blue prints or samples.

URING COMPANY

MICHIGAN

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RAILS (Continued)

ROBE OR COAT RAILS (Continued)

AMERICAN Brass Novelty Co., Grand Haven, Mich.

AMESBURY Brass & Foundry Co., Amesbury, Mass.

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BROWN Robelock Co., Temple Bldg., Duluth, Minn.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

COWLES & Co., C., New Haven, Conn.
(See page 257.)

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

DOUGLAS & Lomason Co., Detroit, Mich.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

ENTERPRISE Brass & Plating Co., 2838-44 Spring Grove Ave., Cincinnati, O.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 606 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HIGHTON & Sons Co., Wm., Nashua, N. H.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

JONAH & George, Merrimac, Mass.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

LAMB Mfg. Co., Winsted, Conn.

METAL Stamping Co., 18th St., & Boulevard, Long Island City, N. Y.

MURDOCK, Jr. Co., Jas., 110 Opera Pl., Cincinnati, O.

NOVELTY Mfg. Co., 125 Maple St., Waterbury, Conn.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y.
(See page 223.)

REGAN & Kirwin Mfg. Co., 87 Shattuck St., Lowell, Mass.

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

STERLING—See Auto Accessories Mfg. Co.

WAKEFIELD Sales Co., Trempealeau, Wis.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

RECORDERS

VEHICLE MOVEMENT RECORDERS

(For recording time vehicle is used)

AMERICAN Taximeter Co., Broadway & 57th St., New York, N. Y. "Recordograf."

BROWN Spring Oiler Co., 7007 Carnegie Ave., Cleveland, O. "Traflog."

HOGGSON & Co., S. H., Thames Bldg., New York, N. Y. "Joyometer."

JONES Speedometer Co., Bush Terminal, Brooklyn, N. Y.

JOYOMETER—See Hoggson & Co.

RECORDOGRAF—See American Taximeter Co.

SERVICE Recorder Co., 2344 E. 105th St., Cleveland, O. "Servis."

SERVIS—See Service Recorder Co.

TAFILOG—See Brown Spring Oiler Co.

VEHICLE-SAFEGUARD Instrument Co., 1733 Broadway, New York, N. Y.

RECTIFIERS

ALTERNATING CURRENT RECTIFIERS

AMERICAN Battery Co., 1132-34 Fulton St., Chicago, Ill. "Amrec," "Autrec."

AMREC—See American Battery Co.

AUTREC—See American Battery Co.

ECONOMY—See Electric Economy Co.

EDISON, Thomas A., 114 Lakeside Ave., Orange, N. J.

ELECTRIC Economy Co., Hyde Park, Mass. "Economy."

ELECTRIC Products Co., 1067 E. 152d St., Cleveland, O. "Wotton."

ELECTRIC Storage Battery & Mfg. Co., Cincinnati, O.

ELLINGTON Electric Co., 128 S. Fourth St., Quincy, Ill.

FRANCE Mfg. Co., 1432 W. 75th St., Cleveland, O.

GENERAL Electric Co., Schenectady, N. Y.

HERTNER Electric & Mfg. Co., 430 Prospect Ave., N. W., Cleveland, O.

HICKLEY, Thomas, Belmar, N. J.

MOHAWK Electric Mfg. Co., 45 Lawrence St., Newark, N. J.

MURPHY Electricity Rectifier Co., 187 N. Water St., Rochester, N. Y.

ST. LOUIS Electrical Works, 5417 Easton Ave., St. Louis, Mo.

SIMPLICITY—See Wilson Supply Co.

SIRCH Electrical & Testing Laboratories, 136 W. Third St., Los Angeles, Cal.

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RECTIFIERS (Continued)

ALTERNATING CURRENT RECTIFIERS (Continued)

STAHL Rectifier Co., 536 S. Clark St., Chicago, Ill.

STANDARD Metal Mfg. Co., Newark, N. J. (See page 277.)

UNITED Electric Apparatus Co., 1529 Columbus Ave., Boston, Mass.

WAGNER Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

WILSON Supply Co., 1191 Gladys Ave., Cleveland O. "Simplicity."

WOTTON—See Electric Products Co.

REEDS

HORN REEDS

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y.

NONPAREIL Horn Mfg. Co., 73-75 Wooster St., New York, N. Y.

RILEY-KLOTZ Mfg. Co., 17 Mulberry St., Newark, N. J.

STANDARD Metal Mfg. Co., Newark, N. J. (See page 277.)

REFLECTORS

MIRROR LAMP REFLECTORS

BACHE & Co., Semon, West & Hubert Sts., New York, N. Y.

BAUSCH & Lomb Optical Co., St. Paul & Smith Sts., Rochester, N. Y.

FRY Glass Co., H. C., Rochester, Pa.

JEFFERSON Glass Co., Follansbee, W. Va.

LANCASTER Lens Co., 220-26 W. Main St., Lancaster, O.

MACBETH-EVANS Glass Co., Wabash Terminal Bldg., Pittsburg, Pa.

MATISSE, C. & A., 543-49 E. 116th St., New York, N. Y.

NATIONAL Reflector Co., Clarksburg, W. Va.

REGULATORS

ACETYLENE PRESSURE OR REDUCING VALVE REGULATORS

(For use with acetylene lamps or starters: See also Controllers, Acetylene Lamps)

BISHOP-BABCOCK-BECKER Co., E. 49th St. & Hamilton Ave., Cleveland, O.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

FUEL FEED REGULATORS

OFELDT & Sons, F. W., Nyack, N. Y.

TANK PRESSURE REGULATORS

(For regulating the exhaust pressure on gasoline or oil tanks)

BOSTON—See Powell Co.

BUCKEYE—See Central Brass & Fixture Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

LOCKE Regular Co., 76 North St., Salem, Mass.

LUNKENHEIMER Co., 222 E. Eighth Ave., Cincinnati, O.

MIDDY—See Powell Co.

NEPTUNE—See Powell Co.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. "Neptune," "Boston," "Middy." (See page 781.)

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

WATER LEVEL REGULATORS

OFELDT & Sons, F. W., Nyack, N. Y.

WINDOW REGULATORS

COWLES & Co., C., New Haven, Conn. "Fisher." (See page 257.)

DURA Mechanical Hardware Co., 3138 Monroe St., Toledo, O. (See page 687.)

FISHER—See Cowles & Co.

LIBERTY Cut Glass Works, Egg Harbor City, N. J. (See page 269.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

PERFECT Window Regulator Co., 20 Exchange Pl., New York, N. Y.

REMOVERS

CARBON REMOVERS

(See also Compounds, Carbon Removing; also Scrapers Carbon; also Machines, Motor Decarbonizing)

MICHENER, E. S., 80 Washington St., New Castle, Pa.

TEEPELL, Edward A., 1523 N. 62d St., Philadelphia, Pa.

PAINT, ENAMEL AND VARNISH REMOVERS

ACME White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

AD-EL-ITE—See Adams & Elting Co.

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Candler Cellular Radiators

STRONG—LIGHT IN WEIGHT—EFFICIENT

We are building a High Quality Cellular Radiator possessing the above features. Being of unique design and construction we are able to offer a Cellular Radiator at a very interesting price. We solicit your inquiries.

CANDLER RADIATOR COMPANY
DETROIT, MICH.

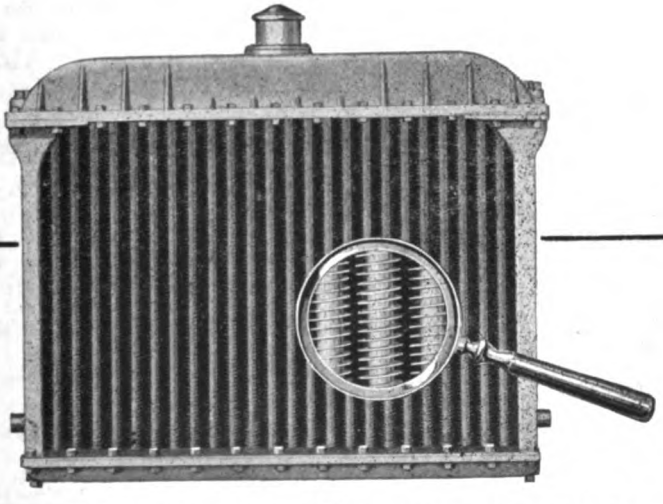
HANDSOME IN APPEARANCE

ADLAKE

TRUCK LAMPS are made to *withstand* the severe requirements of truck service.

Write for descriptive bulletin.

THE ADAMS & WESTLAKE CO.
New York Chicago Philadelphia



"Radiator Insurance"

Seamless Copper Helical Tube Cooling Sections are guaranteed for the life of the motor on which they are installed. Helical Tube construction satisfies the most exacting requirements.

We are also manufacturers of **Genuine Square Tube Honeycomb Mercedes Type Radiators** for pleasure cars.

SEND US YOUR BLUE PRINTS

Manufactured only by

Rome-Turney Radiator Company, Rome, New York

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REMOVERS (Continued)

PAINT, ENAMEL AND VARNISH REMOVERS (Continued)

ADAMS & Elting Co., 718-26 Washington Blvd., Chicago, Ill. "Ad-el-ite."

ALBANY Chemical Co., 22 Broadway, Albany, N. Y.

BERRY Bros., Detroit, Mich.

BILCHACO—See Billings-Chapin Co.

BILLINGS-CHAPIN Co., Cleveland, O. "Bilchaco."

BLUE Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston Mass. "Premium."

BRADLEY & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "Crown."

BRIDGEPORT Wood Finishing Co., New Milford, Conn.

CALLERY & Co., W. W., 188 36th St., Pittsburg, Pa.

CHALMERS Chemical Co., 218 McWhorter St., Newark, N. J. "Phenoid."

CROWN—See Bradley & Vrooman Co.

DENEGRE Baked Enamel Remover Co., 1922-24 Ave. F, Birmingham, Ala.

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers Abluent."

EBERSON-LINDSLEY Paint Co., 19th & Morgan Sts., St. Louis, Mo. "V. & P."

ECLIPSE—See Gould & Cutler.

ENTERPRISE Paint Mfg. Co., Peoria & Van Buren Sts., Chicago, Ill. "Noxall."

FOREST City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

GILLESPIE & Son, Chas. H., 19 Dey St., Jersey City, N. J. "Monarch Bull Dog."

GLIDDEN Varnish Co., Cleveland, O. (See page 553.)

GOULD & Cutler, 45 Sudbury St., Boston, Mass. "Eclipse."

H C Red Label Chemical Co., Boston, Mass.

IDOL-YUSSO—See Schlegel Mfg. Co.

JEWEL—See Wadsworth-Howland Co.

KLEAN-ITT—See Lawrence & Co.

KLENSA—See Standard Varnish Works.

KUT-KOTE—See Thurston Co.

LAWRENCE & Co., W. W., Pittsburg, Pa. "Klean-itt."

LINGERWETT—See Wilson Remover Co.

LUCAS & Co., John, 322-30 Race St., Philadelphia, Pa. "Mirac."

MIRAC—See Lucas & Co.

MOLLER & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y.

MONARCH Bull Dog—See Gillespie & Son.

NICE, Eugene E., 272-74 S. Second St., Philadelphia, Pa.

NOXALL—See Enterprise Paint Mfg. Co.

PARROTT Varnish Co., 453 N. Washington Ave., Bridgeport, Conn.

PENINSULAR Paint & Varnish Co., Detroit, Mich.

PHENOID—See Chalmers Chemical Co.

PREMIUM—See Blue Ribbon Co.

ROGERS ABLUENT—See Detroit White Lead Works.

SCHLEGEL Mfg. Co., Oscar, 111 E. 13th St., New York, N. Y. "Idol-Yusso."

STANDARD Varnish Works, (Elm Park), Port Richmond, N. Y. "Klensa."

THURSTON, Co., F. W., 1832-34 S. Clark St., Chicago, Ill. "Kut-Kote."

TILCO Co., 814-20 S. Vandeventer Ave., St. Louis, Mo.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WILSON Remover Co., 115 Chestnut St. Newark, N. J. "Wonderpaste," "Lingerwett."

WONDERPASTE—See Wilson Remover Co.

REPAIRERS

SPRING REPAIRERS

(See Clamps, Spring Repair)

RESTS

BOW RESTS

(See also Holders, Top; also Separators, Bow)

AMERICAN Brass Novelty Co., Grand Haven, Mich.

ANCHOR—See North & Judd Mfg. Co.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

CAMPBELL—See Perkins Campbell Co.

DESOCO—See Detroit Socket Co.

DETROIT Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

HOOVER Co., W. H., New Berlin, O.

JONAH & George, Merrimac, Mass.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NORTH & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 835.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 207.)

SCHERER & Co., H., Detroit, Mich.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

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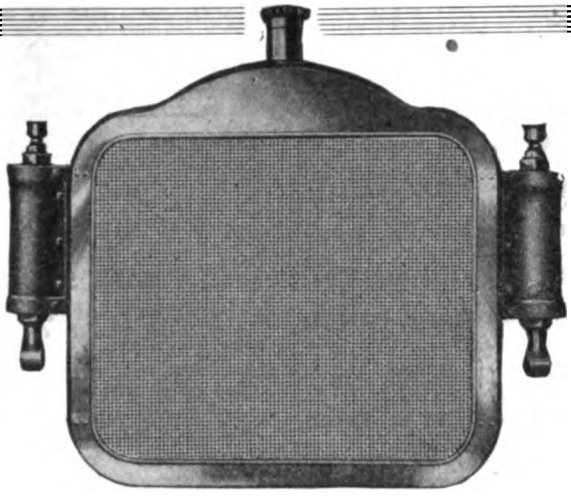

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QUALITY
STRENGTH
REPUTATION

The equipment by America's foremost pleasure cars and trucks with Fedders Radiators year after year, has established Fedders Quality so well that a good portion of our facilities are kept busy building radiators for manufacturers who prefer to design their own cooling systems.

The continued usage of Fedders Radiators—either special or standard—by practically every manufacturer who ever has placed an initial order with us is conclusive evidence of our ability to serve you to your complete and lasting satisfaction.

FEDDERS MFG. CO., Inc.

BUFFALO **NEW YORK**

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RESTS (Continued)

FOOT RESTS

(See also Hassocks)

A-Z Co., 530 W. 56th St., New York. N. Y. (See page 417.)

AETNA Brass Mfg. Co., 3870-90 Hamilton Ave., Cleveland, O.

ALLEN Fire Department Supply Co., Providence, R. I.

AMESBURY Brass & Foundry Co., Amesbury, Mass.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

COWLES & Co., C., New Haven, Conn. (See page 257.)

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (See page 717.)

DOUGLAS & Lomason Co., Detroit, Mich.

ENTERPRISE Brass & Plating Co., 2838-44 Spring Grove Ave., Cincinnati, O.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland O. (See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

HIGHTON & Sons Co., Wm., Nashua, N. H.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

JONAH & George, Merrimac, Mass.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NOVELTY Mfg. Co., 125 Maple St., Waterbury, Conn. "Waterbury."

REGAN & Kirwin Mfg. Co., 87 Shattuck St., Lowell, Mass.

SARGENT Mfg. Co., New & Summit Sts., Newark, N. J.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

WATERBURY—See Novelty Mfg. Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

HEEL RESTS

AUTO Pedal Pad Co., 794 Seventh Ave., New York, N. Y.

FUQUA Bros., 2418 W. Main St., Richmond, Va.

LUCAS & Son, J. L., 3 Fox St., Bridgeport, Conn.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

RETAINERS

BALL RETAINERS

BEARINGS Co. of America, 250 W. 54th St., New York, N. Y. "Star." (See page 115.)

BOSSERT Co., Utica, N. Y. (See page 279.)

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

OAKES Pressed Steel Co., Indianapolis, Ind.

STAR—See Bearings Co. of America.

WORCESTER Pressed Steel Co., Worcester, Mass. (See page 213.)

RHEOSTATS

BATTERY CHARGING RHEOSTATS

ALLEN-BRADLEY Co., 495-97 Clinton St., Milwaukee, Wis.

CUTLER Hammer Mfg. Co., 12th St. & St. Paul Ave., Milwaukee, Wis.

ELECTRIC Products Co., 1067 E. 152d St., Cleveland, O.

GENERAL Electric Co., Schenectady, N. Y.

H-B—See Hobart Bros. Co.

HOBART Bros. Co., 113 Water St., Troy, O. "H-B."

INDUSTRIAL Controller Co., 886 Greenbush St., Milwaukee, Wis.

LEONARD Electric Co., Ward, Mt. Vernon, N. Y.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

RIMS

QUICK DETACHABLE RIMS

KELSEY Wheel Co., Detroit, Mich. (See page 569.)

MOTT Wheel Works, Utica, N. Y. (See page 497.)

STANDARD Welding Co., Cleveland, O. "Stanweld." (See Book Mark.)

STANWELD—See Standard Welding Co.

REMOVABLE OR DEMOUNTABLE RIMS

BAKER—See Universal Rim Co.

BERRY Rim Co., Detroit, Mich. (See page 437.)

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GRANT SIX

Facts Every Dealer in Automobiles Should Know

That the Grant Six was the *first* six cylinder car ever produced for less than a thousand dollars.

The 1917 Grant Six makes its bid for public favor solely on the basis of extra value—obvious value. You can see it yourself!

The Grant Six is backed by a capital of $4,000,000.

Increased facilities including a brand new factory make possible a production of 20,000 cars. The Grant dealer organization includes 1200 dealers all over the world.

Five Passenger Touring Car.....	$ 825
Three Passenger Roadster.....	825
Three Passenger Cabriolet.....	1,050

f. o. b. factory

Success for *some* dealers is spelled G-R-A-N-T. Write.

Grant Motor Car Corporation
Findlay, Ohio

Scripps-Booth

Luxurious light cars which in their first season have found the way into America's and Europe's most refined society. Scripps-Booth stand out as the most attractive cars in the roadster and four-passenger class—cars of beauty possessing comfort heretofore unknown. Roadster, $825; Coupe, $1,450; 8-cylinder, four-passenger, $1,175.

Scripps-Booth Co.
Detroit, Mich.

PULLMAN DINER

Three Auto Party Hotel Meals Pay for Case

SAVES TIME, PATIENCE, MONEY

Goes in any Car or Boat. Waterproof Covered and Lined.

"MADE-RIGHT" Motor Luncheon Case and Table

With Dishes, Cutlery, Removable Metal Food Boxes, Etc. Compartments for three 1-qt. Thermos or Vacuum Bottles or Jars. Each compartment will take two 1-qt. Mason Jars instead, if preferred.

Without Bottles, otherwise complete, for six persons

RETAIL, $15.00 DEALERS, $10.00

Knickerbocker Case Company

Fulton and Clinton Streets CHICAGO

Order Through Your Jobber

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RIMS (Continued)

REMOVABLE OR DEMOUNTABLE RIMS (Continued)

COPITHORN Rim & Tire Co., 262 Washington St., Boston, Mass.

DETROIT—See Jackson Rim Co.

FIRESTONE Tire & Rubber Co., Akron, O.

FUNK—See Mott Wheel Works.

G. R. C.—See General Rim Co.

GENERAL Rim Co., St. Marys, Pa. "G. R. C."

HOWARD Demountable Rim Co., 1850 E. State St., Trenton, N. J.

JACKSON Rim Co., Jackson, Mich. "Detroit."
(See page 427.)

KELSEY Wheel Co., Detroit, Mich.
(See page 569.)

MICHELIN Tire Co., Milltown, N. J.
(See Inside Back Cover.)

MOTE Demountable & Detachable Rim Co., Wayne County Bank Bldg., Detroit, Mich.

MOTT Wheel Works, Utica, N. Y. "Funk," "Quality."
(See page 497.)

NEWMASTIC Co., 151 W. 68th St., New York, N. Y.

PRESTO Inter-Rim Co., 940 Commonwealth Ave., Boston, Mass.

QUALITY—See Mott Wheel Works.

SPRANGER Wheel & Rim Co., 139 Beaubien St., Detroit, Mich.

STANDARD Welding Co., Cleveland, O. "Stanweld."
(See Book Mark.)

STANWELD—See Standard Welding Co.

UNIVERSAL Rim Co., 1502 Michigan Ave., Chicago, Ill. "Baker."
(See page 633.)

WESTON-MOTT Co., Flint, Mich.
(See page 463.)

RUBBER STEERING WHEEL RIMS

GENERAL Insulate Co., 1008-14 Atlantic Ave., Brooklyn, N. Y.

LUZERNE Rubber Co., Trenton, N. J.

STOKES Rubber Co., Jos., Trenton, N. J.

STANDARD RIMS

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

JACKSON Rim Co., Jackson, Mich.
(See page 427.)

KELSEY Wheel Co., Detroit, Mich.
(See page 569.)

MOTT Wheel Works, Utica, N. Y.
(See page 497.)

STANDARD Welding Co., Cleveland, O. "Stanweld."
(See Book Mark.)

STANWELD—See Standard Welding Co.

UNIVERSAL Rim Co., 1502 Michigan Ave., Chicago, Ill.
(See page 633.)

WOOD RIMS OR FELLOES

CAMPBELL & Dann Mfg. Co., Tullahoma, Tenn.

COLUMBUS Bending Co., Columbus, O.

CRANE & MacMahon, St. Marys, O. "Nut," "Star."
(See page 569.)

EBERLY & Orris Mfg. Co., Mechanicsburg, Pa.

HARTWELL & Co., C. L., Chicago Heights, Ill.

JONES & Co., Phineas, Newark, N. J.
(See page 681.)

KOLLER & Co., J. B., Mechanicsburg, Pa.

LEBZELTER & Son Co., Philip, Lancaster, Pa.
(See page 843.)

NUT—See Crane & MacMahon.

SKINNER Bending Co., J. M., Broadway & Wabash R. R., Toledo, O.

STAR—See Crane & MacMahon.

TOLEDO Bending Co., Toledo, O.

TUCKER Woodwork Co., Sidney, O.

WOOD STEERING WHEEL RIMS

AMERICAN Wood Rim Co., Onaway, Mich.

DETROIT Auto Dash Co., 519-21 Beaubien St., Detroit, Mich.

DETROIT Bow Co., Dubois & Guoin Sts., Detroit, Mich.

HABERKORN & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

TUCKER Woodwork Co., Sidney, O.

WAYNE Steering Wheel & Bow Co., Wayne, Mich.

RINGS

DUST RINGS

(See Washers, Felt)

PISTON RINGS

AALDING Mfg. Co., Manchester, N. H.
(See page 739.)

A. C. Non-Leakable Piston Ring Co., Compton, Ill.

AMERICAN Piston Ring Co., 2730 15th Ave., S., Minneapolis, Minn. "Economy."

AMERICAN Piston Ring Co., Dept. D., Newark, N. J.
(See page 429.)

AUTO Engine Works, St. Paul, Minn.
(See page 219.)

AUTO Parts Mfg. Co., 710 Bluff St., Sioux City, Ia.

AUTOMOBILE Accessories Co., 816 W. North Ave., Baltimore, Md. "No-Leak-O."
(See page 681.)

AUTOMOBILE Construction & Engineering Co., 45 N. Seventh St., Philadelphia, Pa. "Perfection."

B-W.—See Ballman-Whitten Mfg. Co.

B & O Piston Ring Co., Indianapolis, Ind.

BAKER Valve Co., 1847 E. 28th St., Minneapolis, Minn. "Vapor-Tight."

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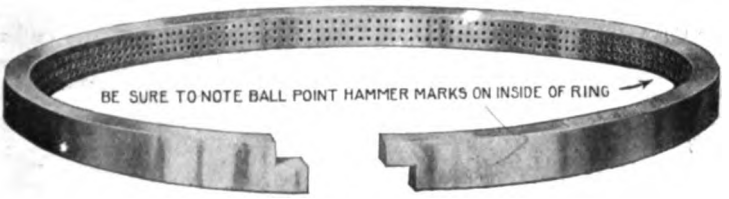
American Hammered Piston Ring

(PEENED CONCENTRIC RINGS)



The ring that has taken the Automobile World by storm; the ring that is **guaranteed** to **decrease** the consumption of gasoline from 15 to 25%; **decrease** the consumption of oil from 50 to 75%; **increase** the power of your car's motor 10 to 25%; and **eliminate** oil, carbon, spark plug and smoking troubles.

Here are some of the more prominent automobiles on which

are used as standard equipment:

PIERCE-ARROW, CHALMERS, LOZIER, WINTON, STEARNS, MERCER, DAUCH TRACTORS and INTERNATIONAL MOTOR TRUCKS.

Backed up by the endorsement of manufacturers like these, American Piston Rings will prove a tremendous money-making proposition to live men.

To Garage Men

Install American Hammered Piston Rings in your customers' cars. They will give unfailing satisfaction to them and a good margin of profit to you. You are protected by our money-back factory guarantee.

To Accessory Dealers

Stimulate your business, satisfy your customers, and make good profits by selling American Hammered Piston Rings. You can do a fine business on our FORD SPECIAL at $5.00 per set of 12 rings. Factory guarantees money back if results claimed are not obtained.

Some desirable territory still open for exclusive agency proposition to right men. Write for details of proposition

AMERICAN PISTON RING COMPANY

DEPT. D, NEWARK, N. J.

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RINGS (Continued)

PISTON RINGS (Continued)

BALLMAN-WHITTEN Mfg. Co., 5407 Easton Ave., St. Louis, Mo. "B-W."

BRIDGEPORT Piston Ring Co., Connecticut Ave. & Third St., Bridgeport, Conn.

BRYANT Machinery Co., Eighth & Commerce Sts., Fort Worth, Tex.

BURD High Compression Ring Co., Rockford, Ill.

CHALSMITH Co., 2157 W. Van Buren St., Chicago, Ill. "Gill."

CHOPA Piston Ring Co., J. A., 264 E. Jefferson Ave., Detroit, Mich.

CONTINENTAL Piston Ring Co., 648-50 Marshall Ave., Memphis, Tenn. "Hi-Comp."

CRAVEN Co., Edwin T., 2310-12 N. Second St., Philadelphia, Pa. "Eclipse." (See page 431.)

DAVIDSON Multiple Ring Co., 227 W. 64th St., New York, N. Y. (See page 437.)

DETROIT Piston Ring Co., 49-57 Richmond Ave., Detroit, Mich. "Gaslok." (See page 435.)

DU BOIS Machine Shop, 118 Hudson St., Albany, N. Y.

DUNHAM Piston Ring Co., 250 W. 54th St., New York, N. Y. "Duplex."

DUPLEX—See Dunham Piston Ring Co.

ECLIPSE—See Hope Machine Co.

ECO Mfg. Co., 53 State St., Boston, Mass. (See page 831.)

ECONOMY—See American Piston Ring Co.

END-OXY Appliance Co., Trenton, N. J. "Leektite."

EVER-TIGHT Piston Ring Co., 1435 Chestnut St., St. Louis, Mo. (See page 433.)

FERRO Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

GASLOK—See Detroit Piston Ring Co.

GILL—See Chalsmith Co.

GREEN Engineering Co., Dayton, O. (See page 869.)

HAMLIN Piston Ring Co., 13 Woodward Ave., Detroit, Mich.

HEBERT Mfg. Co., Franklin, N. H.

HI-COMP—See Continental Piston Ring Co.

HORAT, J., Lafayette, Ind. "Tight-Wad."

HOUPERT Machine Co., 349 W. 52d St., New York, N. Y. (See page 847.)

INLAND Machine Works, Eighth & Mound Sts., St. Louis, Mo.

K-P—See Keys Piston Ring Co.

KEYS Piston Ring Co., 3054 Olive St., St. Louis, Mo. "K-P." (See page 695.)

LAKE Sales Co., 1947 Broadway, New York, N. Y. (Distributors.) (See page 867.)

LEAK-PROOF—See McQuay-Norris Mfg. Co.

LEEKTITE—See End-Oxy Appliance Co.

LONGAKER Co., V. A., Indianapolis, Ind. "W'right."

McCADDEN Machine Works, St. Cloud, Minn.

McQUAY-NORRIS Mfg. Co., 2832 Locust St., St. Louis, Mo. "Leak-Proof." (See page 433.)

MERRITT Co., S. Whyle, 311 W. 59th St., New York, N. Y.

MICRO Piston Ring Co., 1960 Broadway, New York, N. Y. (See page 823.)

MILLER Carburetor Sales Corp., 2526 Michigan Ave., Chicago, Ill. (See page 597.)

MODERN Electric & Machine Co., 946 Fort Wayne Ave., Indianapolis, Ind. "R. & M."

NO-LEAK-O—See Automobile Accessories Co.

ONE-IN-ONE Piston Ring Co., 996 N. Seventh St., Philadelphia, Pa.

PENNSYLVANIA Specialty Co., 5 E. 14th St., New York, N. Y.

PERFECTION—See Automobile Construction & Engineering Co.

PERFECTION Piston Ring Co., 149 West St., Gardner, Mass.

PISTON Ring Co., Dept. 65, Muskegon, Mich. "Sta-Tite," "Quality." (See page 433.)

PONDELICK'S Piston Ring Co., 215 S. Leavitt St., Chicago, Ill.

PRESCOTT Auto Parts Co., Webster, Mass. (See page 433.)

PRESSURE Proof Piston Ring Co., 208 Warren St., Needham, Mass.

QUALITY—See Piston Ring Co.

R & M—See Modern Electric & Machine Co.

SPACKE Machine Co., F. W., Indianapolis, Ind. (See page 325.)

STA-TITE—See Piston Ring Co.

TEETOR-HARTLEY Motor Co., Hagerstown, Ind.

TIGHT-WAD—See Horat, J.

TRUMP Mfg. Co., Crown Point, Ind.

VAPOR-TIGHT—See Baker Valve Co.

WAINWRIGHT & Son, W. W., Connersville, Ind. (See page 797.)

WASSON Piston Ring Co., Jersey Ave., New Brunswick, N. J.

W'RIGHT—See Longaker Co.

RIVETS

BRASS AND COPPER RIVETS

ATLAS Tack Co., Fairhaven, Mass.

BLAKE & Johnson Co., Waterbury, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn. "Crown."

CLENDENIN Bros., Central Ave. & Fawn St., Baltimore, Md.

CLEVELAND Wrought Washer Co., 3590 W. 58th St., Cleveland, O.

COBB & Drew, Plymouth, Mass.

CROWN—See Bridgeport Brass Co.

EAGLE—See Plume & Atwood Mfg. Co.

FALLS Rivet Co., Kent, O.

HASSALL, John, Clay & Oakland Sts., Brooklyn, N. Y.

PLUME & Atwood Mfg. Co., 470 Bank St., Waterbury, Conn. "Eagle."

PROGRESSIVE Mfg. Co., Torrington, Conn.

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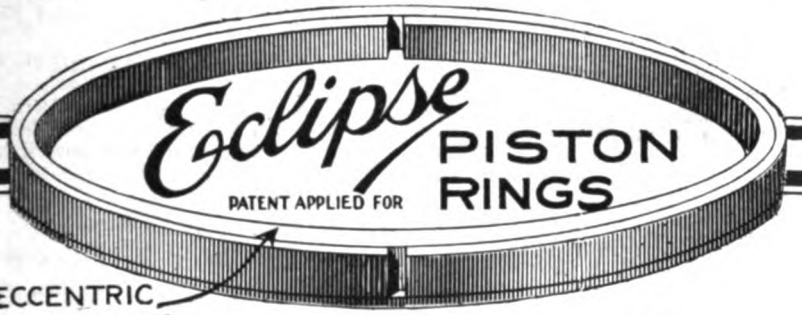

The Only Piston Ring With the Inside Eccentric Ring

Give Even Pressure On Every Square Inch of Surface

THE HOLDING POINT OF CONTACT

Technically: The "ECLIPSE" PISTON RING is composed of two rings, one eccentric L ring and the other concentric and flat. The eccentric ring is to get an even pressure at all points around the cylinder. The eccentric ring is held tight at the joint by the concentric ring, which enables it to conform exactly to the diameter of the cylinder. This ring has a straight cut, which prevents compression turning the outside ring on the eccentric ring, thereby making pins unnecessary and eliminating weak places

ECLIPSE PISTON RINGS PRODUCE ONE-THIRD MORE POWER

And Save One-Third Cost of Fuel and Oil Consumption over any other piston rings sold.

Covered by a Broad and Liberal Guarantee

MOTOR AND AUTOMOBILE MANUFACTURERS

Increase the power of your motors by using as *standard equipment ECLIPSE PISTON RINGS.* You know that it is only possible to get the best out of compression and securely hold it by using leakless piston rings. After close examination, as mechanical experts, you will doubtless decide that the *Eclipse* is the most correctly designed piston ring manufactured.

We will leave the *Eclipse* up to your judgment. We anticipate that you will be interested and that we will hear from you.

May we submit quantity prices NOW?

Answer today.

AUTOMOBILE REPAIRMEN AND DEALERS

The *Eclipse,* with its correct feature in its Eccentric Inside Ring, will win and hold for you the piston ring business of your territory.

Write us NOW for selling agreement.

HOPE MACHINE CO., Mfrs.

THE EDWIN T. CRAVEN CO., Sole Distributors

2310-12 N. Second St. Philadelphia, Pa.

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RIVETS (Continued)

BRASS AND COPPER RIVETS (Continued)

ROME Brass & Copper Co., Rome, N. Y.

STEELE & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

WATERBURY Brass Goods Corp., 160 Washington Ave., Waterbury, Conn.

WATERBURY Mfg. Co., Waterbury, Conn.

COPPER RIVETS

(See Rivets, Brass)

IRON AND STEEL RIVETS

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

AMERICAN Screw Co., 21 Stevens St., Providence, R. I.

ATLAS Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

CHAMPION Rivet Co., Harvard Ave. & E. 108th St., Cleveland, O. "Victor."

COBB & Drew, Plymouth, Mass.

COLUMBUS Bolt Works Co., Columbus, O. (See page 119.)

FALLS Rivet Co., Kent, O.

GARLAND Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburg, Pa.

GRAND Crossing Tack Co. (Grand Crossing), Chicago, Ill.

HASSALL, John, Clay & Oakland Sts., Brooklyn, N. Y.

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

KANSAS City Bolt & Nut Co. (Sheffield Station), Kansas City, Mo.

LAMSON & Sessions Co., 2188 Scranton Rd., Cleveland, O.

NATIONAL Screw & Tack Co., Cleveland, O. (See page 119.)

NEWARK Rivet Works, 262 Lafayette St., Newark, N. J.

PITTSBURG Screw & Bolt Co., Preble Ave. (N. S.), Pittsburg, Pa.

PLYMOUTH Mills, Plymouth, Mass.

READING Screw Co., Norristown, Pa.

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

UPSON Nut Co., Unionville, Conn.

VICTOR—See Champion Rivet Co.

PLATINUM RIVETS

(See Platinum)

TUBULAR AND CLINCH RIVETS

THOMPSON Mfg. Co., Judson L., Waltham, Mass.

TUBULAR Rivet & Stud Co., Boston, Mass. (See page 817.)

ROBES

AUTOMOBILE LAP ROBES

AMERICAN Buffalo Robe Co., 1-7 Howell St., Buffalo, N. Y.

AUTO-COMFORT Robe Co., 417 N. Main St., Gloversville, N. Y.

AUTOMOBILE Apparel Co., Port Chester, N. Y. "Frunt-Seat."

AYRES & Sons, Wm., Cumberland & Fourth Sts., Philadelphia, Pa.

B. E. Mfg. Co., 444 Broadway, New York, N. Y. (See page 205.)

BALLARD & Co., J. O., Malone, N. Y.

BECKMAN Co., 3167 Fulton Rd., Cleveland, O.

BISHOP Co., J. H., Wyandotte, Mich.

BURLINGTON Blanket Co., Burlington, Wis. "Sho-Fur," "Wul-Auto."

CHASE & Co., L. C., Boston, Mass. (See page 313.)

CHICAGO Auto Robe Supply Co., 12-16 S. Market St., Chicago, Ill.

CROSBY-FRISIAN Fur Co., 571 Lyell Ave., Rochester, N. Y.

CURTIS & Von Bernuth Mfg. Co., 88 W. Broadway, New York, N. Y.

DAVIS, Geo. W., 32 Southgate St., Worcester, Mass.

DAVIS Robe & Armor Co., 3 N. State St., Chicago, Ill.

DAWSON, J. & E., Fairhill Station, Philadelphia, Pa. "Name-On."

DRAPER Bros. Co., Canton, Mass.

FRUNT-SEAT—See Automobile Apparel Co.

GAUSLER & Starr Co., Delaware & Walnut Sts., Philadelphia, Pa.

GORDON Co., J. P., 302 N. Forth St., Columbus, O. (See page 195.)

HODGMAN Rubber Co., 306 Broadway, New York, N. Y.

MINNESOTA Motorobe Co., Temple Bldg., Duluth, Minn.

MONTANA—See Wallace Co.

MOORE-SMITH Co., 250 Devonshire St., Boston, Mass.

NAME-ON—See Dawson, J. & E.

NEW YORK Lap Robe Co., 28-32 W. Third St., New York, N. Y.

OAKLAND—See Robe Lock Co.

PERFECTION Fur Robe Co., 16 S. Market St., Chicago, Ill.

REVILLON Frères, 19 W. 34th St., New York, N. Y.

RILEY & Co., Wm. B., 238 Chestnut St., Philadelphia, Pa.

ROBE Lock Co., 1853 38th Ave., Oakland, Cal. "Oakland."

SHO-FUR—See Burlington Blanket Co.

WALLACE Co., Hugh, 2626 E. Grand Blvd., Detroit, Mich. "Montana."

WINSHIP, W. W., 71 Summer St., Boston, Mass.

WUL-AUTO—See Burlington Blanket Co.

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Quality Snap Rings are manufactured under a basic patent that enables us to secure perfect accuracy of dimension and greater elasticity. This, together with the fact that we specialize in the manufacture of piston rings, gives us the power to excel in this one field.

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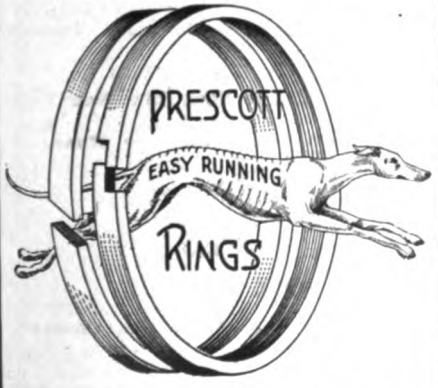

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RODS

ADJUSTABLE VALVE LIFT RODS

BRIDGEPORT—See Lyford Bros.

LYFORD Bros., 625 Washington Ave., Bridgeport, Conn. "Bridgeport."

ALUMINUM RODS

(See Aluminum, Sheet)

BRAKE RODS

JACOBS Co., F. L., 449-53 Gusin St., Detroit, Mich.
(See page 329.)

MICHIGAN Electric Welding Co., Detroit, Mich.
(See page 297.)

SCHWEPPE & Wilt Mfg. Co., Detroit, Mich.
(See page 415.)

STANDARD Welding Co., Cleveland, O.
(See Book Mark.)

BRASS RODS

(See Brass, Sheet)

CONNECTING RODS

(Finished or Machined Rods. For connecting rods in the rough—See Forgings, Drop)

BILLINGS & Spencer Co., Hartford, Conn.

CLIMAX Machinery Co., 143-63 E. Morris St., Indianapolis, Ind.

GILL & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y.
(See page 669.)

LAYMAN Pressed Rod Co., 1790 Broadway, New York, N. Y. "Pres-Tube."

PRES-TUBE—See Layman Pressed Rod Co.

STANDARD Gauge Steel Co., Beaver Falls, Pa.
(See page 813.)

TINDEL-MORRIS Co., Eddystone, Pa.

COPPER RODS

(See Brass, Sheet)

FIBRE RODS

(See Fibre, Hard)

RUBBER RODS

(See Rubber, Hard)

STEEL RODS

(See Steel)

ROLLERS

CURTAIN ROLLERS

CAREY & Co., 246-48 N. Fifth St., Philadelphia, Pa. "Edw. Reukauf."

COWLES & Co., C., New Haven, Conn.
(See page 257.)

EDW. REUKAUF—See Carey & Co.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

ROPE

BRONZE WIRE ROPE OR CABLE

ELEPHANT—See Phosphor Bronze Smelting Co.

OMEGA—See Riverside Metal Co.

PHOSPHOR Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. "Elephant."
(See page 331.)

REEVES & Co., Paul S., 1415-25 Catherine St., Philadelphia, Pa.

RIVERSIDE Metal Co., Riverside, N. J. "Omega."

STEEL WIRE ROPE OR CABLE

AMERICAN Steel & Wire Co., Chicago, Ill.
(See page 575.)

BRODERICK & Bascom Rope Co., 817 N. Second St., St. Louis, Mo.

CRESCENT—See Moon Co.

HAZARD Mfg. Co., 81 E. Ross St., Wilkes-Barre, Pa.

LESCHEN & Sons Rope Co., A., 620 N. First St., St. Louis, Mo.

MACOMBER & Whyte Rope Co., 567-69 S. Clinton St., Chicago, Ill.

MOON Co., Geo. C., 124 White St., New York, N. Y. "Crescent."

ROEBLINGS Sons Co., John A., Trenton, N. J.

TRENTON Iron Co., Trenton, N. J.

WATERBURY Co., 63 Park Row, New York, N. Y.

WRIGHT Wire Co., Worcester, Mass.
(See page 437.)

ROPES

TOW ROPES

AMERICAN Steel & Wire Co., Chicago, Ill.
(See page 575.)

AUTOWLINE—See Broderick & Bascom Rope Co.

BRODERICK & Bascom Rope Co., 817 N. Second St., St. Louis, Mo. "Autowline."

CRESCENT—See Moon Co.

EXCELSIOR—See Wright Wire Co.

HERCULES—See Leschen & Sons Rope Co.

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For Ford and All Other Cars

Exclusive Selling Points Make Big Sales

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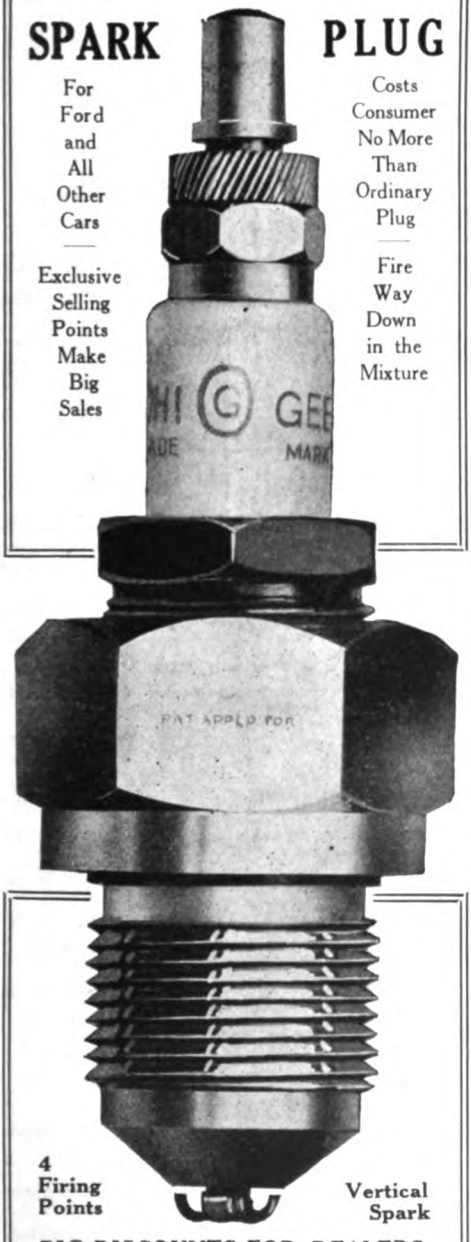
Fire Way Down in the Mixture



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DETROIT MICH.

Detroit Piston Ring Co.

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DETROIT, MICH.

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ROPES (Continued)

TOW ROPES (Continued)

HOGARTY, Edward, Unionville, Conn. "Utility."

JONES Auto Supply Co., 25th St. & Broadway, Oakland, Cal. "Vim."

LESCHEN & Sons Rope Co., A., 920 N. First St., St. Louis, Mo. "Hercules."

MOON Co., Geo. C., 124 White St., New York, N. Y. "Crescent."

ROCHESTER Rope Goods Co., 330 Florida St., Milwaukee, Wis.

SPENCER Wire Co., Worcester, Mass.

UPSON-WALTON Co., Cleveland, O.

UTILITY—See Hogarty, Edward.

VIM—See Jones Auto Supply Co.

WRIGHT Wire Co., Worcester, Mass. "Excelsior."
(See page 437.)

RUBBER

HARD RUBBER

(Sheet, Rod and Tube)

AMERICAN Hard Rubber Co., 9 Mercer St. New York, N. Y.

LUZERNE Rubber Co., Trenton, N. J.

SIEMON Hard Rubber Co Bridgeport, Conn

STOKES Rubber Co., Jos., Trenton, N. J.

WILKIE Rubber Mfg. Co., Lynn, Mass.

SCRAPERS

CARBON SCRAPERS

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BUFFUM Tool Co., Louisiana, Mo.

FLEXIBLE Carbon Scraper Co., 2011½ S. Vermont Ave., Los Angeles, Cal.

FLEXO—See Gemco Mfg. Co.

GEMCO Mfg. Co., 606 S. Pierce St., Milwaukee, Wis. "Flexo."
(See page 127.)

IDEAL Valve Grinder Co., 1478 W. 22nd St., Los Angeles, Cal. "Little Dandy."

LITTLE DANDY—See Ideal Valve Grinder Co.

MARCY Tool Works, Putnam, Conn.

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo.
(See page 747.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

OSBORNE & Co., C. S., Harrison, N. J.

FOOT SCRAPERS

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

SCREENS

HORN SCREENS

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y.

STANDARD Metal Mfg. Co., Newark, N. J.
(See page 277.)

SCREW-EYES

BRASS AND IRON SCREW-EYES

BROOKS & Sons, M. S., Chester, Conn.

JENCKES Mfg. Co., E., 28 Union St., Worcester, Mass.

SARGENT & Co., Water & Wallace Sts., New Haven, Conn.

WIRE Goods Co., 28 Union St., Worcester, Mass.

SCREWS

CAP AND SET SCREWS

ALLEN Mfg. Co., 135 Sheldon St., Hartford, Conn.

ATLAS Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

AUTOMATIC Products Co., 22-24 Dubois St., Detroit, Mich.
(See page 347.)

BRISTOL Co., Waterbury, Conn.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill.
(See page 287 and 443.)

CINCINNATI Screw Co., Twightwee, O.
(See page 571.)

CLARK Bros. Bolt Co., Milldale, Conn.
(See page 119.)

COLUMBUS Bolt Works Co., Columbus, O.
(See page 119.)

CORBIN Screw Corp., New Britain, Conn.
(See page 831.)

CURTIS Screw Co., 17 Gull St., Buffalo, N. Y.

DETROIT Screw Works, Detroit, Mich.
(See page 849.)

EASTERN Machine Screw Corp., Barclay & Truman Sts., New Haven, Conn.

FERRY Cap & Set Screw Co., 2151 Scranton Rd., Cleveland, O.

FOSTER—See New Haven Screw Co.

FOSTORIA Screw Co., Fostoria, O.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn.
(See page 383.)

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

MAC-IT Parts Co., Manheim Pike, Lancaster, Pa.

NATIONAL-ACME Mfg. Co., Cleveland, O.
(See page 441.)

NEW Haven Screw Co., New Haven, Conn. "Foster."

PAWTUCKET Mfg. Co., 327 Pine St., Pawtucket, R. I.

PENINSULAR Milled Screw Co., 1090 Lafayette St. E., Detroit, Mich.

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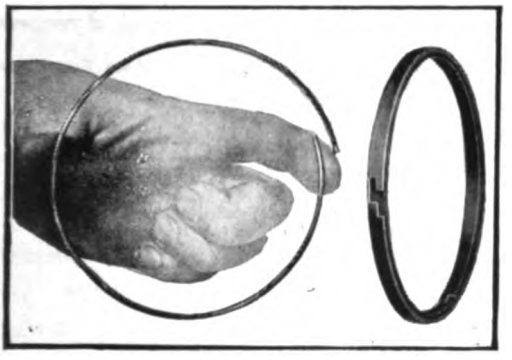

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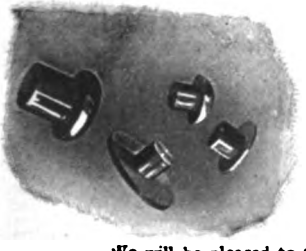

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SCREWS (Continued)

CAP AND SET SCREWS (Continued)

PHILLIPS Mfg. Co., R. B., Worcester, Mass.

PITTSBURG Screw & Bolt Co., Preble Ave. (N. S.), Pittsburg, Pa.

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

RHODE Island Tool Co., Providence, R. I.

ROCHESTER Machine Screw Co., Caledonia St., Rochester, N. Y.

RUSSELL & Erwin Mfg. Co., New Britain, Conn.

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill.
(See page 255.)

SHIMER & Sons, Samuel J., Milton, Pa.

UPSON Nut Co., Unionville, Conn.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.
(See page 441.)

WORCESTER Machine Screw Co., 79 Beacon St., Worcester, Mass.

COACH AND LAG SCREWS

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

CLARK Bros. Bolt Co., Millidale, Conn.
(See page 119.)

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

LAMSON & Sessions Co., 2188 Scranton Rd., Cleveland, O.

NATIONAL Screw & Tack Co., Cleveland, O.
(See page 119.)

OLIVER Iron & Steel Co., Pittsburg, Pa.

PAWTUCKET Mfg. Co., 327 Pine St., Pawtucket, R. I.

REPUBLIC Iron & Steel Co., Republic Bldg., Youngstown, O.

UPSON Nut Co., Scranton Rd., Cleveland, O.

LAG SCREWS

(See Screws, Coach and Lag)

MACHINE SCREWS

AMERICAN Screw Co., 21 Stevens St., Providence, R. I.

ATLAS Bolt & Screw Co., 1239 Marquette Rd., Cleveland, O.

BLAKE & Johnson Co., Waterbury, Conn.

CINCINNATI Screw Co., Twightwee, O.
(See page 571.)

CORBIN Screw Corp., New Britain, Conn.
(See page 831.)

DETROIT Screw Works, Detroit, Mich.
(See page 849.)

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn.
(See page 388.)

INTERNATIONAL Machine & Screw Co., 172 Lyman St., Springfield, Mass.

NATIONAL-ACME Mfg. Co., Cleveland, O.
(See page 441.)

NATIONAL Lock Co., Seventh St. & 19th Ave., Rockford, Ill.

NATIONAL Screw & Tack Co., Cleveland, O.
(See page 119.)

NEW Haven Screw Co., New Haven, Conn.

PROGRESSIVE Mfg. Co., Torrington, Conn.

RAMSDELL Specialty Co., W. Boylston St., Worcester, Mass.

READING Screw Co., Norristown, Pa.

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

RUSSELL & Erwin Mfg. Co., New Britain, Conn.

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill.
(See page 255.)

STEELE & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

U. S. Automatic Co., Amherst, O.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.
(See page 441.)

WORCESTER Machine Screw Co., 79 Beacon St., Worcester, Mass.

SET SCREWS

(See Screws, Cap and Set)

THUMB SCREWS

BILLINGS & Spencer Co., Hartford, Conn.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill.
(See pages 287 and 443.)

DEVLIN Mfg. Co., Thos., Third & Lehigh Aves., Philadelphia, Pa.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

PENINSULAR Milled Screw Co., 1000 Lafayette St. E., Detroit, Mich.

ROCHESTER Machine Screw Co., Caledonia St., Rochester, N. Y.

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SCREW Machine Products Corp., 1012 Eddy St., Providence, R. I.

STEELE & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.
(See page 441.)

WOOD SCREWS

AMERICAN Screw Co., 21 Stevens St., Providence, R. I.

ATLANTIC Screw Works, Charter Oak Ave., Hartford, Conn.

BRIDGEPORT Screw Co., Bridgeport, Conn.

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Make a Four Run Like a Six

One-third as heavy as cast iron pistons and proportionately economical in action. Give more speed, more miles per gallon of gasoline and quicker acceleration. Deaden the noise, reduce vibration and friction to a minimum, and insure maximum efficiency from piston rings.

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SCREWS (Continued)

WOOD SCREWS (Continued)

CONTINENTAL Wood Screw Co., New Bedford, Mass.

CORBIN Screw Corp., New Britain, Conn. (See page 831.)

FEDERAL Screw Corp., 393 Harris Ave., Providence, R. I.

INTERNATIONAL Machine & Screw Co., 172 Lyman St., Springfield, Mass.

NATIONAL Lock Co., Seventh St. & 19th Ave., Rockford, Ill.

NATIONAL Screw & Tack Co., Cleveland, O. (See page 119.)

READING Screw Co., Norristown, Pa.

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

RUSSELL & Erwin Mfg. Co., New Britain, Conn.

SCREW MACHINE PRODUCTS

SPECIAL SCREW MACHINE PRODUCTS TO ORDER

ALBAUGH-DOVER Co., 2100 Marshall Blvd., Chicago, Ill. (See page 673.)

AMERICAN Ball Co., 115 Clifford St., Providence, R. I.

AMERICAN Brass Novelty Co., Grand Haven, Mich.

AMERICAN Pin Co. (Waterville Station), Waterbury, Conn.

ANSONIA Mfg. Co., Ansonia, Conn.

ASHLEY Machine Works, 724 University Ave., Rochester, N. Y. (See page 323.)

ATLAS Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

ATLAS Brass Foundry Co., 980-90 S. Front St., Columbus, O.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

AUTOMATIC Products Co., 22-24 Dubois St., Detroit, Mich. (See page 347.)

BABSON-DOW Mfg. Co., 60 Fulda St. (Roxbury), Boston, Mass.

BALL & Roller Bearing Co., Danbury, Conn. (See page 99.)

BARD Mfg. Co., 582 Main St., Waltham, Mass.

BARNES Co., Wallace, Wallace & Parallel Sts., Bristol, Conn.

BELVIDERE Screw & Machine Co., Belvidere, Ill.

BLAIR Tool & Machine Works, 521 Greenwich St., New York, N. Y.

BLAKE & Johnson Co., Waterbury, Conn.

BROWN Bag Filling Machine Co., 20 Main St., Fitchburg, Mass. (See page 501.)

CASSADY-FAIRBANK Mfg. Co., 6106-20 La Salle St., Chicago, Ill.

CHICAGO Automatic Machine Co., Oakley & Kinzie Sts., Chicago, Ill.

CHICAGO-RACINE Aluminum, Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 287 and 443.)

CINCINNATI Screw Co., Twightwee, O. (See page 571.)

CITY Iron Works & Machine Co., 520 S Delaware Ave., Philadelphia, Pa. (See page 795.)

CLARK Novelty Co., 330 Exchange St. Rochester, N. Y.

CLIMAX Machinery Co., 143-63 E. Morris St., Indianapolis, Ind.

COLUMBUS Auto Parts Co., 215-31 E. Russell St., Columbus, O. (See page 763.)

CORBIN Screw Corp., New Britain, Conn. (See page 831.)

CORNWALL & Patterson Mfg. Co., Bridgeport, Conn.

CURTIS Screw Co., 17 Gull St., Buffalo, N. Y.

DEFIANCE Screw Machine Products Co., 731 Perry St., Defiance, O.

DETROIT Screw Works, Detroit, Mich. (See page 849.)

EASTERN Machine Screw Corp., Barclay & Truman Sts., New Haven, Conn.

ECLIPSE Mfg. Co., Indianapolis, Ind.

ENTERPRISE Mfg. Co., Akron, O.

ERICSSON Screw Machine Products Co., 601 Bergen St., Brooklyn, N. Y.

FARIES Mfg. Co., Decatur, Ill.

FERRY Cap & Set Screw Co., 2151 Scranton Rd., Cleveland, O.

FISCHER Special Mfg. Co., 2076-78 Reading Rd., Cincinnati, O.

FOSTORIA Screw Co., Fostoria, O.

GARVIN Machine Co., Spring & Varick Sts., New York, N. Y.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y.

GREER, Frederic, 525 W. Van Buren St., Chicago, Ill.

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

HANSON, Henry L., 26 Union St., Worcester, Mass.

HANSON Bros., 533-43 Southington Ave., Plainville, Conn.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. (See page 383.)

HILL Co., Geo. Q., 32-34 Dorchester Ave., Boston, Mass.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

INDIANAPOLIS Tool & Mfg. Co., 520 S. Capitol Ave., Indianapolis, Ind.

KALES-HASKEL Co., 441-53 Lafayette Blvd., Detroit, Mich.

KEAVENEY & Son, W. R., Waterbury, Conn.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

KEYLESS Lock Co., 1401 Newman St., Indianapolis, Ind.

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MAKERS of Standard and Special Milled Screw Machine Work from Iron, Steel and Brass Bars. Capacities up to 2¼" diameter and 10½" long.

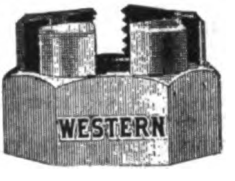
AT CLEVELAND AND MONTREAL

Branch Offices: New York, Chicago, Boston, Detroit. Warehouses: New York, 77 White St.; Chicago, 23 So. Jefferson St. Southern Reps.: V. A. Moore & Co., Atlanta, Healy Building. Pacific Coast Reps.: Hughson & Merton, San Francisco.

Standard S.A.E. or A.L.A.M. Hexagon Plain & Castle Nuts

Carried in Stock

Large Quantities of sizes ranging from 1-4" to 1" inclusive which insures prompt delivery.



Our Nuts

Are turned from bar stock which has a tensile strength of 90,000 lbs. per square inch and an elastic limit of 75,000 lbs.

"Specials" made to "Order." Any piece from Iron, Steel, Brass or Bronze which can be turned in a screw machine.

"Western Service Book" can be had for the asking.

The Western Automatic Machine Screw Co.

750 LAKE AVENUE, ELYRIA, OHIO

Detroit Sales Office, 1019 Dime Bank Bldg.

Established 1873

Cleveland Sales Office and Warehouse: 1224 West 6th St.

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SCREW MACHINE PRODUCTS (Continued)

SPECIAL SCREW MACHINE PRODUCTS TO ORDER (Continued)

KRAHN Mfg. Co., 588 Clinton St., Milwaukee, Wis.

McCULLY, R. P. & C. H., 331-35 Van Buren St., Brooklyn, N. Y.

MACHINE Parts Co., Elyria, O.

MANN Corp., Kankakee, Ill.

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 249.)

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.) (See pages 547, 727 and 819.)

MICHIGAN Screw Co., Lansing, Mich.

MILLHOLLAND Machine Co., W. K., Tenth & Canal Sts., Indianapolis, Ind.

MOESTA & Ruehrwein, Hulbert Blk., Cincinnati, O.

MORGAN Mfg. Co., John St., Newport, R. I.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (See page 867.)

NATIONAL-ACME Mfg. Co., Cleveland, O. (See page 441.)

NATIONAL Sewing Machine Co., Belvidere, Ill.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NEW Haven Screw Co., New Haven, Conn.

NEW Home Sewing Machine Co., Orange, Mass.

OHIO Metal Products Co., 39 N. Edgar St., Dayton, O.

OLSON Mfg. Co., 54 Commercial St., Worcester, Mass.

OSBORNE & Stephenson Mfg. Co., Plainville, Conn. (See page 709.)

PARKER White Metal & Machine Co., Railroad St., Erie, Pa. (See page 149.)

PECK & Young Mfg. Co., Forestville, Conn.

PEERLESS Automatic Machine Co., 1970 W. 77th St., Cleveland, O.

PENINSULAR Milled Screw Co., 1090 Lafayette St. E., Detroit, Mich.

PERRY-FAY Mfg. Co., Elyria, O. (See page 709.)

PHILADELPHIA Machine Screw Works, 624-26 Race St., Philadelphia, Pa.

PHILLIPS Mfg. Co., R. B., Worcester, Mass.

RACINE Metal Stamping Co., 1501 Clark St., Racine, Wis.

RAMSDELL Specialty Co., W. Boylston St., Worcester, Mass.

REED & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

REESE Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

RHODE Island Tool Co., Providence, R. I.

RELIANCE Engineering Co., Lansing, Mich.

ROSS Machine Co., 208 S. Fourth St., La Fayette, Ind.

S. A. Machine Co., Detroit, Mich. (See page 749.)

ST. LOUIS Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill. (See page 255.)

SCREW Machine Products Corp., 1012 Eddy St., Providence, R. I.

SERVICE Gear & Machine Co., Reading, Pa. (See page 817.)

SMITH Mfg. Co., F. H., 3037 Carroll Ave., Chicago, Ill.

SNOW-DOLE-RICHARDS Co., 9-15 Murray St., New York, N. Y.

STANDARD Mfg. Co., 990 Housatonic Ave., Bridgeport, Conn.

STEELE & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

TORRINGTON Mfg. Co., Torrington, Conn.

U. S. Automatic Co., Amherst, O.

VOELKNER & Harry Mfg. Co., 282-92 Woodbridge St., E., Detroit, Mich.

WARE Bros., 224 N. Ada St., Chicago, Ill. (See page 339.)

WATERBURY Mfg. Co., Waterbury, Conn.

WATKINS Co., D. M., Pine & Eddy Sts., Providence, R. I.

WESTERN Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 441.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WESTERN Screw-Products Co., 3200-14 S. Seventh St., St. Louis, Mo.

WOLVERINE Brass Works, Grand Rapids, Mich.

WOLVERINE Screw Co., 51-53 Fort St., E., Detroit, Mich.

WORCESTER Machine Screw Co., 79 Beacon St., Worcester, Mass.

SEARCHLIGHTS

ACETYLENE SEARCHLIGHTS

(See Lamps, Acetylene)

ELECTRIC SEARCHLIGHTS

(See Headlights, Electric)

SEATS

SUPPLEMENTARY SEATS

AMESBURY Brass & Foundry Co., Amesbury, Mass.

BUFFINGTON & Co., C. A., Berkshire, N. Y.

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

HODGE & Graves Co., Amesbury, Mass. "Luxury." (See page 853.)

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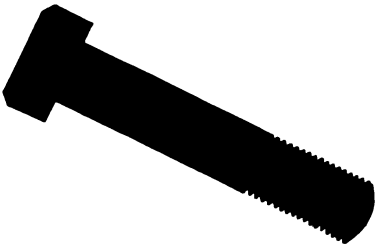
Set Screws
Cap Screws
Studs
Taper Pins
Semi-Fin Nuts
Castle Nuts



Special Work
Gear Blanks
Clevis Pins
Conn Rod Bolts
Spring Shackle Bolts
Valve Lifters
Valve Rollers
Idler Studs

THE CHICAGO SCREW CO.

Est. 187 Homan Ave. & Fillmore St. CHICAGO, ILL.

Robe Rails, Foot Rests, Tire Holders
Body Hardware, Tank & Radiator Fittings

GREASE PUMPS SPECIAL WORK

Jobbers, get in touch with us.

Catalog on request.

NEW SUPPLEMENT JUST OUT.

ATTWOOD BRASS WORKS Grand Rapids, Mich.

WE MAKE CASTINGS

that meet all the requirements of the most exacting engineers. In quality, dimensions and time of delivery we conform absolutely to specifications as agreed upon.

We specialize in automobile castings made of grey iron or semi-steel.

Our prices will prove entirely satisfactory.

THE AUTO CASTINGS CO.
2088 Scranton Road, Cleveland, O.

Booth Iron-Wood Bumpers

Made of selected straight grain live rock maple turned to 2⅜ in. diameter, steamed at high pressure in a special steaming retort, which forces out all the sap and acid from the timber and leaves them stronger and lighter than iron.

Will not rust or rattle. Cannot bend or buckle. Will stand twice the shock. Can be painted any color.

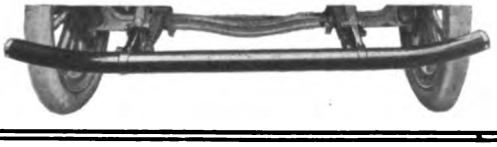
Easily attached by black enamel, malleable iron fittings.

Will fit any car with projecting springs.

They list at $6.00 with a generous trade discount.

THE BOOTH BUMPER CO., Toledo, Ohio

ZINKE CO., 1322 Michigan Ave., Chicago, Ill.
General Sales Agents



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SEATS (Continued)

SUPPLEMENTARY SEATS (Continued)

IMPERIAL Bit & Snap Co., Racine, Wis. (See page 815.)

KIMBALL & Co., C. P., Chicago, Ill. (See page 129.)

LUXURY—See Hodge & Graves Co.

McKINNON Dash Co., 253 Amherst St., Buffalo, N. Y.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

POLSON Mfg. Co., 27 Chenango St., Buffalo, N. Y.

SEPARATORS

BOW SEPARATORS

(See also Holders, Top)

AMERICAN Brass Novelty Co., Grand Haven, Mich.

AMESBURY Brass & Foundry Co., Amesbury, Mass.

ANCHOR—See North & Judd Mfg. Co.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

BAIR—See Auto Specialties Mfg. Co.

CANFIELD Rubber Co., Bridgeport, Conn.

DESOCO—See Detroit Socket Co.

DETROIT Socket Co., 314 Jefferson Ave., W., Detroit, Mich, "Desoco."

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

JONAH & George, Merrimac, Mass.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

NEVER-RUB—See Springfield Auto Top & Upholstery Co.

NORTH & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 835.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y. (See page 223.)

PENNSYLVANIA Rubber Co., Jeannette, Pa.

SCHERER & Co., H., Detroit, Mich.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

SPRINGFIELD Auto Top & Upholstery Co., Sanford St., Springfield, Mass. "Never-Rub."

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco." (See page 613.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

GASOLINE SEPARATORS

(See Strainers, Gasoline)

SHAFTING

FLEXIBLE SHAFTING

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

COATES Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.

COOPER Flexible Transmission Co., Eighth Ave. & 18th St., Brooklyn, N. Y.

GEM Mfg. Co., Goebel & Fulton Sts., Pittsburg, Pa.

P R Mfg. Co., 621 Bellevue Ave., Detroit, Mich.

STOW Flexible Shaft Co., 26th & Callowhill Sts., Philadelphia, Pa.

STOW Mfg. Co., 443 State St., Binghamton, N. Y.

WEBB Mfg. Co., ft. Center St., Newark, N. J. (See page 739.)

WHITE Dental Mfg. Co., S. S., 5-9 Union Sq., W., New York, N. Y.

SHAFTS

CAMSHAFTS

(See Camshafts, Finished)

COUNTERSHAFTS

(See Countershafts, Finished)

CRANKSHAFTS

(Crankshafts; also Forgings, Drop)

FLEXIBLE SHAFTS

(See Shafting, Flexible)

PROPELLER SHAFTS

HARTFORD Auto Parts Co., Hartford, Conn. (See page 863.)

KINSLER-BENNETT Co., 69 Vernon St., Hartford, Conn. (See page 287.)

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y. (See page 804.)

SPICER Mfg. Co., South Plainfield, N. J. (See page 747.)

UNIVERSAL Machine Co., Adams St., Bowling Green, O.

SHEAVES

SHEAVES AND PULLEYS

(For Horn and Cut-out Cables)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

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THE ZINKE COMPANY

Jobbers and Manufacturers

Selling—Not Jobbing—Is Our Business

It costs little more to sell for ten manufacturers than it does for one.

It costs tremendously less for each manufacturer to pay his share of the selling expense for ten than it does to maintain his own sales organization.

The result is reduced prices, common interests, common patrons, and a sales organization infinitely better controlled than any individual sales organization can possibly be.

The ZINKE Company is such a sales organization. We represent, *as a selling force* manufacturers of automobile accessories and parts. We are the unit with whom you deal. Your business relations with all our manufacturers require but one letter, one order, one command.

The ZINKE Company sells standard lines—often at the *lowest prices known in the automobile business.* You can deal with us at an additional saving—simplifying your buying routine, receiving quicker service, with best prices always. Our manufacturers ship and bill your goods.

Dealers

If your regular jobber cannot take care of your requirements on our products, write us and we will see that some jobber does.

The Zinke Company

1322-1324-1326 Michigan Ave. Chicago, U. S. A.

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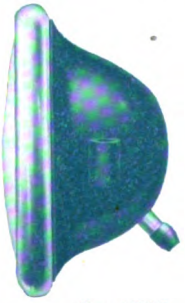
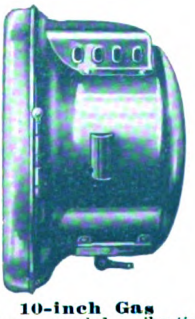
THE ZINKE COMPANY

Automobile Head Lamps

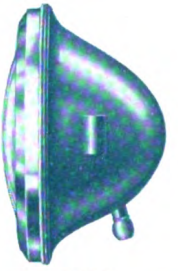
The usual high quality Indiana Electric Headlamps are furnished with 6-7 volt bulbs, double pole unless otherwise specified, focusing sockets. Other voltages and double bulbs furnished if desired at usual advances. Ediswan Bayonet Sockets and Plugs. Finished in black and nickel, black and brass or all black.



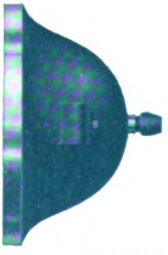
No. 1216
12-in. Front. Props, 9¼ in.
Per Pair, **$18.50**
No. 1116
11-in. Front. Props, 8½ in.
Per pair, **$14.50**
No. 1016
10-in. Front. Props, 7 in.
Per Pair, **$12.50**



10-inch Gas
Close coupled, vibration proof. Genuine ground glass mirror and silvered front reflector. 10-in. diameter, 6-in. mirror. 8½-in. prop centers, 6½-in. deep.
Per Pair, **$10**



No. 1115
Bullet shape, hex. door. Silvered parabolic reflector, hand burnished. Diameter of front. 11½ in., prop centers 8¼ in., depth, 6½ in.
Per Pair, **$11.50**



No. 916
New Ford type. Flat door, plain glass, outside focusing device. Prop centers, 7 in. Can be furnished with bracket attached for 1915-16 Ford.
Per Pair, **$8.50**
Per Pair, with bkt, **$9.25**

8-inch Gas
Ford Gas Lamp, diameter 8 in. Prop centers, 7 in. Also suitable for motorcycle head lamp. Can be had in all nickel.
Per Pair, **$7.00**

No. 1015
Designed especially for Ford cars. Round door, plain glass, distance between prop centers, 7 in. Diameter 10 in.
Per Pair, **$10.25**
Per Pair, with bkt., **$11.00**

No. 616. Spotlight

For windshield or foredoor. Universal bracket permits light to be thrown in any direction. Diminishing mirror in handle. Can be used night and day. Self-contained switch, true parabolic reflector, inside focusing device. Diameter, 6½ in.

Each **$6.00**

No. 31. Dome Lamp
Diameter 4½ in. Frosted cut glass, Ediswan socket. Finished in all brass or all nickel. Bulb easily removed and replaced. Polished back gives maximum light.
Each **$2.50**

Manufacturers

Indiana Lamp Company **Connersville, Ind.**

Exclusive Sales

The Zinke Co. **1326 Michigan Ave., Chicago**

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THE ZINKE COMPANY

Automobile Side and Tail Lamps

All lamps are of latest design. Parts are interchangeable and of perfect fit. Made of heavy steel. Vibration proof and practically indestructible. Oil pots cannot rattle or come off. Ediswan Bayonet Sockets and Plugs in Combination and Electric Lamps.

No. 26. Oil
Round type. 8½ in. high, 5 in. from back to front, diameter of glass, 3⅞ in. Guaranteed to stay lighted.
Oil, Pair, **$4.50**
Combination, Pair, **$5.00**

No. 26-A. Oil
Same as No. 26, with extra large 5-in. flange. Most sturdy for truck use.
Oil, Pair, **$5.50**
Combination, Pair, **$6.00**

No. 22. Oil
Square type, drop riveted through heavy steel plate, making strongest possible construction. Will not rattle or leak.
Oil, Pair, **$5.50**
Combination, Pair, **$6.00**

No. 615. Electric
Same design as bullet shape head lamps. Round door, curved glass. Makes popular Electric Motorcycle Head Lamp. Diameter, 6 in. Depth, 4½ in.
Per Pair, **$8.00**

No. 30 Convex Flange Dash Lamp
White frosted rosette or semaphore glass. No visible screws. Rear door. Accessible
Per pair, **$4.00**

"Elite"
Ford type. Plain glass. Regular brackets or to fit 1915-16 Ford. Diameter 4½ in.
Per pair, **$6.00**

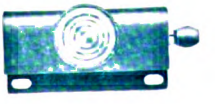
No. 24 Oil
Same type as No. 26.
Oil Each, **$2.50**
Combination Each, **$3.00**

No. 32-C
4½-in. red semaphore lens in rear, white in side.
Each, **$1.75**

No. 23 Oil
Square type like No. 22.
Oil, Each, **$2.75**
Combination Each, **$3.50**

No. 32-CL
Like No. 32-C but with License Bracket.
Each, **$2.00**

No. 33
Fastens on license number. 6⅞ in. long.
Each, **$2.50**



Manufacturers
Indiana Lamp Company **Connersville, Ind.**

Exclusive Sales
The Zinke Co. **1326 Michigan Ave., Chicago**

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THE ZINKE COMPANY

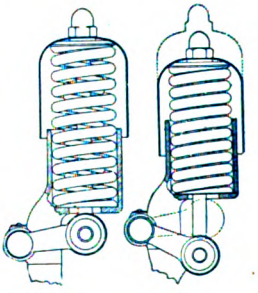
Temco Shock Absorbers for Ford Cars

"Duck Type"

$15 Per Set of Four

Guaranteed for Life

Telescoped, Temco Shock Absorbers are about as tall as other Ford Shock Absorbers normally are. When in normal position, extended, they are the tallest on the market. Temco Crucible Vanadium Steel. Helical Springs are **longest, strongest, most flexible.** Radius Links prevent side-sway and minimize skidding. Will not "lop."



Temco-Alta Universal Shock Absorbers

$12 Per Pair

Three Sizes

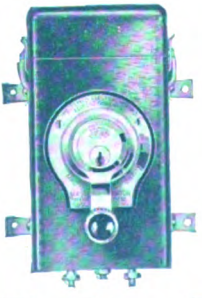
Class "B"—Cars from 1700 to 2900 lbs.
Class "C"—Cars from 3000 to 3900 lbs..
Class "D"—Cars from 4000 lbs. up.

Always give weight or model of car when ordering.

Temco-Alta Shock Absorbers need no grease. Adjusted to weight of car. Easily and quickly installed. No holes to drill. Complete for any car having ¾ Elliptic Springs. Add over 15 feet of extra springs that absorb vibrations and save tires. Guaranteed.

Temco Master Vibrator

$12.50 Each



Big, powerful condenser, with large platinum iridium contact points that will not stick. Single adjustment for all 4 cylinders. Hot spark, accurately timed. Absolutely Guaranteed.

Temco Lock Switch

$3.50 Each

For Ford Cars

Combines genuine Corbin Cylinder Lock with regular convenient kick switch. Fits any Ford coil. Easily and quickly installed. Protects against theft and tampering.

Manufacturers

The Temco Electric Motor Company Leipsic, Ohio

Exclusive Sales

The Zinke Co. 1326 Michigan Ave., Chicago

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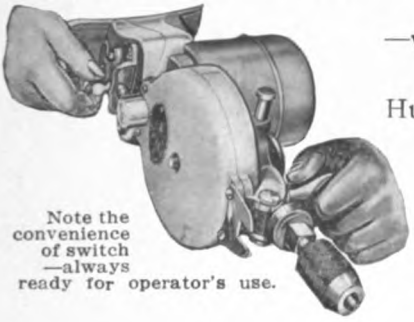
THE ZINKE COMPANY

Quicker Results—Doubled Efficiency



Note the convenience of switch —always ready for operator's use.

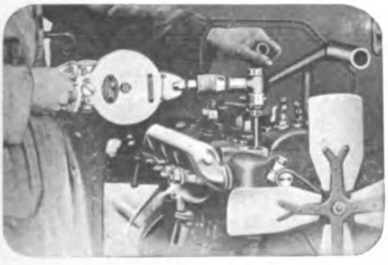
—work with *Electricity*

Hundreds of automobile repair men declare that the most essential part of their shop equipment—equipment that they find absolutely indispensable after once put into use—is the

Temco Garage Outfit

Consisting of the Temco Model "B" Portable Electric Drill with the Emery Wheel and Valve Reseating Attachments.

Drilling—tapping—sharpening tools—valve grinding—and innumerable jobs around the shop can be performed quickly and cheaply with these wonderful tools.



Grinding a Valve

The tool comes with cord and attachment plug. Just attach it to any lamp socket or drop cord—either AC or DC—then go to work. That's all there is to it. A single control switch—located near the handle—right where you need it for fast work—starts, stops or reverses the motor at any time. It is light—12 pounds—so it is easily carried to any part of the shop—even outside when necessary. It drills in steel to ⅜-inch.

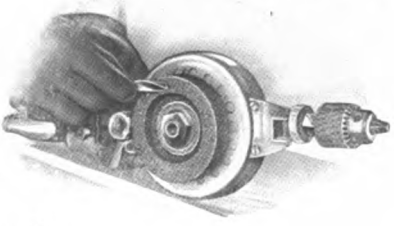
It will stand the hard knock-about usage to which all garage equipment is subjected.

Garageman's Machine Shop

Don't overlook the remarkable utility of the Temco Garage Outfit —it's a regular machine shop in itself.

Both initial cost and operating expense are low. Get quicker—better results. Double your capacity for repairing now while you have a chance. The Temco Garage Outfit will do this for you. It is making money for hundreds of other men like yourself. It is fully guaranteed.

Sharpening a tool



Manufacturers

The Temco Electric Motor Company Leipsic, Ohio

Exclusive Sales

The Zinke Co. 1326 Michigan Ave., Chicago

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THE ZINKE COMPANY

Romort Specialties

Price $3 Each

Automatic Air Valve Style "A"

The Romort Automatic Air Valve, Style "A," is the most popular valve in use for heavy work. Solid bronze, practically indestructable. The new step-up stem fits any size tubing from one-quarter to one-half inch.

Price $1 Each

Automatic Air Valve Style "B"

The Romort Automatic Air Valve, Style "B," is a high grade air valve made to meet the popular demand for a light and inexpensive automatic air device. Solid bronze. Automatic in opening and closing, guaranteed air tight.

Angle Pump Connection Not Automatic Price 40c Each

Extra heavy solid bronze casting built to withstand constant service. Unequaled for Vulcanizing and Repair Shops where automatic air connections are not required.

Straight Pump Connection Not Automatic Price 25c Each

The Romort Straight Pump Connection, not automatic, is intended for use on direct connected air pumps, hand, foot or spark plug. Solid bronze one piece casting.

Air Nozzle-Cushion Cleaner For Romort Valves and Pump Connections. Price 25c

This device is designed to release the plunger in Romort Automatic Air Valves when air is required for the purpose of blowing the dirt and dust off cushion tops, foot mats, machinery, etc.

Rubber Washers For Romort Valves Price 25c per Carton

Romort Rubber Washers are constructed of a special Rubber Compound and will positively outwear any other make. They fit all pump connections. Easily slip on tire valves, will hold firm against high or low air pressure.

Price $3

Romort Engine Cleaner

The Romort Engine Cleaner is a guaranteed device that has no equal for cleaning dirt and grease from the machinery. Constructed on scientific lines, the air does not enter the tank but passes right through the air tube picking up the fluid at the extreme end of the cleaner, thereby eliminating all danger of explosion. Long spout enables operator to reach every corner.

Price 60c Each

Tank Connection

The Romort Tank Connection is intended to connect the air line to the outside hose. Entire connection may be unscrewed at night and taken in, thereby eliminating possibility of theft of hose and air valve. Made of heavy brass union with step-up stem to fit any size hose.

ROMORT GUARANTEE

All goods manufactured by the Romort Manufacturing Company must be perfect in material and workmanship. Any article found defective will be repaired or replaced at their Seattle or Chicago office free of all cost, except transportation charges, which must be prepaid.

Manufacturers

Romort Manufacturing Company — **Seattle, Washington**

Exclusive Sales

The Zinke Co. — **1326 Michigan Ave., Chicago**

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THE ZINKE COMPANY

AUBURN REG. U.S. PAT.

Auburn Spark Plugs

BLAZER REG. U.S. PAT.

AUBURN
No. 8 7/8-18
-Ex. for
Buicks, etc.
Price $.75

AUBURN
Porcelain—1/2 in.

Fits Fords
Price $.75

AUBURN
Porcelain—7/8 in.

Regular
Price $.75

BLAZER,
Aristocrat
of our line.
Unbreakable.
Firetite
core.
The most
durable
plug made.
Price $1.00

AUBURN
Mica, 1/2 in

AUBURN
Mica, 7/8 in.

Price $1.00

AUBURN
Mica Metric

[For Motorcycles
Price $1.00

THE highest quality of material and skilled workmanship in part account for the durability of Auburn Porcelain Plugs. Our porcelains are larger than most and will stand abnormal use and abuse.

The Blazer Plugs with their outside bushing construction permit extra space for the sturdy core of Firetite.

Auburn Mica Plugs have been the standard of their type for seven years. Easily most popular Mica plug on the market.

Our trade proposition is very popular throughout the country. Send for it.

Auburn Ignition Manufacturing Co.
Auburn, N. Y.

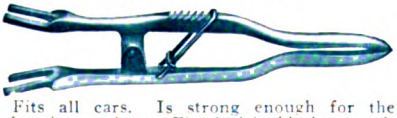
Exclusive Sales The Zinke Co.
1326 Michigan Ave., Chicago, Ill.

Price $1.00

AUBURN
Porcelain
1/2 in. long

For Overlands,
etc., Price $.75

Auburn Valve Lifter



Fits all cars. Is strong enough for the heaviest springs. Finished in black enamel.
Price $.75

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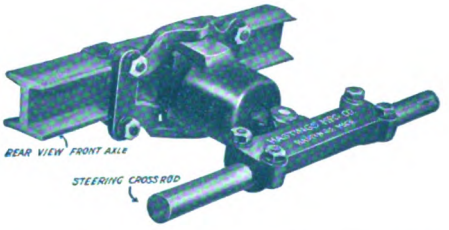
THE ZINKE COMPANY

Drive Your Ford With Comfort and Safety

The Hastings Stabilizer

Makes Steering Easy



Price $3.75 Each

You've seen that worried expression on a Ford driver's face? His car was not equipped with a **Hastings Stabilizer.** If he had installed a **Hastings Stabilizer** on his Ford, he could have stopped gritting his teeth and relaxed his vise-like grip on the steering-wheel. The Stabilizer adds the resistance in the steering-wheel that the driver ordinarily provides when driving his car without it.

Prevents Accidents

A woman or child should never drive a Ford without a **Hastings Stabilizer.** It guards against accidents due to inadequate muscular control of the steering wheel. A small obstruction in the road simply cannot throw you in the ditch.

Light in Weight—Guaranteed to Please

The **Hastings Stabilizer** weighs only four pounds and comes packed in individual cartons ready for shipment. The Stabilizer is guaranteed to give absolute satisfaction. The working parts are of malleable iron and cannot break. The short, stout spring is single-acting and is constructed of the finest spring steel.

Hastings Spring Leaf Oiler

Made in different sizes to fit all cars. They are small and neat in appearance and require no attention except to soak the pads with oil occasionally.

It takes only a few minutes to install the Hastings Leaf Spring Oilers on any car. The illustration shows the simple and efficient method of attachment.

—PRICES—

Ford Type,
No. 1, per set, $1.00

Elliptic Springs,
No. 2, per set, $2.50

Cantilever Springs,
No. 3, per set, $2.00

Manufacturers

Hastings Manufacturing Company, Hastings, Michigan

Exclusive Sales

The Zinke Co. 1326 Michigan Ave., Chicago

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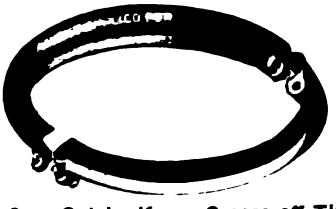
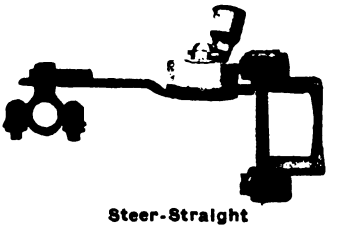
ILLINOIS ACCESSORIES And SPECIALTIES For FORD CARS

Brake Rod Support and Anti-Rattler Style No. 5

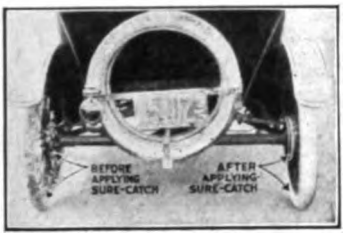


Sure Catch—Keeps Grease off Tires

Brake Rod Support and Anti-Rattler Style No. 6



Steer-Straight



Internal Brake Shoes

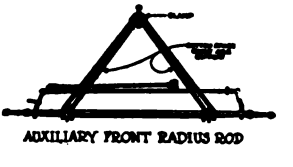
Automatic Windshield Hinge for 1915-1916 Fords with Cowl Dash Price $3.00

We have a Special Model for 1913 and 1914 Ford Windshields

All Steel Cut-Out Valve

Automatic Windshield Hinge—Front View

REAR AXLE TRUSS ROD



AUXILIARY FRONT RADIUS ROD

Buy From Your Jobber—He Has or Will Get It

ILLINOIS BRASS MFG. COMPANY, 226-230 WEST ONTARIO ST., CHICAGO, ILL.

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SHELLS

COPPER BOILER SHELLS

RANDOLPH-CLOWES Co., Waterbury, Conn.

STEEL BOILER SHELLS

JANNEY, Steinmetz & Co., Philadelphia, Pa.
(See page 515.)

PRESSED Steel Tank Co., West Allis, Wis.

SHIELDS

TONNEAU SHIELDS

AUSTER—See Fryer-Auster Co.

BEATONSON—See Sharrer Patent Top Co.

CLARK & Son, A. N., Plainville, Conn.

COLUMBIA Tire & Top Co., 922 Commonwealth Ave., Boston, Mass.

FRYER-AUSTER Co., 11 Pine St., Providence, R. I. "Auster."

J. H. Tonneau Shield Co., 1777 Broadway, New York, N. Y.

SHARRER Patent Top Co., 245 W. 55th St., New York, N. Y. (Importers). "Beatonson."

WIND SHIELDS

ACKERMAN—See Smith & Co.

AINSWORTH Mfg. Co., 36 Dubois St., Detroit, Mich.

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger."
(See page 865.)

AUTO Wind Shield Co., University Rd., Cambridge, Mass.

BADGER—See Auto Parts Mfg. Co.

BANKER Wind Shield Co., Ellsworth & Negley Aves., Pittsburg, Pa.

COLUMBIA Tire & Top Co., 922 Commonwealth Ave., Boston, Mass.

COLUMBUS Auto Parts Co., 215-31 E. Russell St., Columbus, O.
(See page 763.)

CONOVER—See Page Woven Wire Fence Co.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

DIAMOND Mfg. Co., Detroit, Mich.

DOUGLAS & Lomason Co., Detroit, Mich.

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HARTFORD Windshield Mfg. Co., 1006 S. Los Angeles St., Los Angeles, Cal.

KIMBALL & Co., C. P., Chicago, Ill.
(See page 129.)

KRAHN Mfg. Co., 588 Clinton St., Milwaukee, Wis.

MOORE Co., W. J., Montague Ave. & Joy St., Caro, Mich.

MURRAY & Co., P. A., Newton, Mass.

PAGE Woven Wire Fence Co., Adrian, Mich. "Conover."

POLSON Mfg. Co., 27 Chenango St., Buffalo, N. Y.

RANDS Mfg. Co., Detroit, Mich.
(See page 637.)

ROSTAND Mfg. Co., Milford, Conn.

SMITH & Co., Jos. N., Detroit, Mich. "Ackerman."
(See page 227.)

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

SUPERIOR Mfg. Co., Ann Arbor, Mich.

TROY Carriage Sun Shade Co., 710 Lincoln Ave., Troy, O.

UNIVERSAL Wind Shield Co., 1614 Prairie Ave., Chicago, Ill.

VANGUARD Mfg. Co., Detroit, Mich.
(See page 455.)

WESTERN Auto-Body & Mfg. Co., 416-18 E. Ninth St., Los Angeles, Cal.

SHIFTERS

AUTOMATIC GEAR SHIFTERS

C-H—See Cutler Hammer Mfg. Co.

CUTLER Hammer Mfg. Co., 12th St. & St. Paul Ave., Milwaukee, Wis. "C-H."

GEAR Shift Co., 84 Griswold St., Detroit, Mich.

GRAY—See Research Co.

MECHANO Gear Shift Co., 144 Division Ave., N. E., Grand Rapids, Mich.

NUWAY Mfg. Co., Otis Bldg., Chicago, Ill.

RESEARCH Co., Peoples Gas Bldg., Chicago, Ill. "Gray."

SHIMS

BRASS AND COPPER SHIMS AND LINERS

CHANDLER Co., Napier St., Springfield, Mass.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn.
(See page 685.)

GASKET Supply Co., 1729 Ludlow St., Philadelphia, Pa.
(See pages 765 and 795.)

KALES-HASKEL CO., 441-53 Lafayette Blvd., Detroit, Mich.

KICKHAEFER Mfg. Co., 199-201 Oregon St., Milwaukee, Wis.

LAMINATED Shim Co., 533-41 Canal St., New York, N. Y. "Laminum."
(See page 455.)

LAMINUM—See Laminated Shim Co.

Complete Index to Classification appears on Pages 8 to 27.

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Windshields-Vanguard

The largest concern in the world manufacturing windshields for all purposes, exclusively.

The Sales Record shows:

Thirty-three motor car builders are using Vanguard equipment this season.

A majority of commercial body builders are buying the commercial types.

A pleasing share of the special shield business for Ford Cars.

Manufacturers, jobbers and dealers appreciate Vanguard quality, design, service and value.

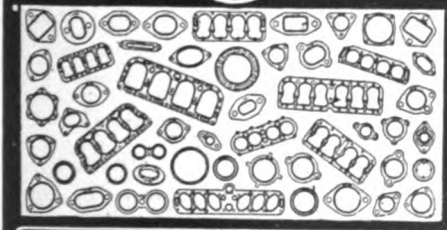
Ask us about your requirements.

Vanguard Manufacturing Company

DETROIT, MICH.

VICTOR GASKETS

Highest Quality — **Copper Asbetos**



The superiority of our product is best evidenced by the fact that you will find Victor Cylinder Head Gaskets on practically every make of Motor with Detachable Head on the market and some of the largest manufacturers like Overland, Ford, Maxwell and Continental Motors use them exclusively.

We respectfully solicit your business!

Our prices are low!

We give all orders our own personal attention and our new strictly fireproof plant doubly strengthens our facilities and we can guarantee deliveries.

VICTOR MFG. & GASKET CO.

The World's Largest Gasket Manufacturers

Troy and 21st Sts. Chicago, U. S. A.

Turn Up a Leaf of the Metal at One Corner of the Shim with a Sharp Knife, and Then Tear Off as You Would From a Pad of Paper

LAMINUM

The only satisfactory shimming material in the world.

Micrometer Accuracy Guaranteed

It is simply a block consisting of a number of sheets of brass .002" (or .003") thick, firmly held together by a metallic binder.

We carry a large stock of varied shapes and make special shapes to order. In ordering state: Total thickness required —Laminations required, .002" or .003".

Send blue prints, and state whether all laminated or part solid and part laminated are wanted, and let us quote you and show you how to save money.

Laminated Shim Co.
Inc.
533 Canal Street
New York City

LAMINATED SHIM CO. Inc.
533-541 Canal Street New York U.S.A.

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SHIMS (Continued)

BRASS AND COPPER SHIMS AND LINERS (Continued)

McCORD Mfg. Co., Detroit, Mich. (See pages 418 and 419.)

SHOCK ABSORBERS

(See also Straps, Rebound; also Springs, Supplementary)

A. V.—See Hudson Export & Import Co.

ANDERSON Spring Co., 12th St. & Hawthorne Ave., Minneapolis, Minn.

CONNECTICUT Shock Absorber Co., Meriden, Conn.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "E-Zer." (See page 717.)

E-ZER—See Cox Brass Mfg. Co.

FLENTJE, Ernst, 1643 Cambridge St., Cambridge, Mass.

FRICTION Shock Absorber Co., Kingston, N. Y.

GABRIEL Mfg. Co., 1407 40th St., N. E., Cleveland, O.

GURNEY, C. S., Portsmouth, N. H.

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J. (See page 457.)

HUDSON Export & Import Co., 1737 Broadway, New York, N. Y. (Importers.) "A. V."

J. H. S.—See Sager Co.

KILGORE Mfg. Co., 727 Boylston St., Boston, Mass.

LANDIS Engineering & Mfg. Co., Waynesboro, Pa.

MARTIN Shock Absorber Corp., 1301-1401 E. Slauson Ave., Los Angeles, Cal.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NACO—See National Appliance Co.

NATIONAL Appliance Co., Engineers Bldg., Cleveland, O. "Naco."

PENFIELD Shock Absorber Mfg. Co., 49 Randolph Ave., Meriden, Conn.

RE-AC Co., 20 Mercer St., New Castle, Pa.

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y. "J. H. S."

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich. "Yankee."

WESTINGHOUSE Air Spring Co., Smedley Bldg., New Haven, Conn.

YANKEE—See Simplex Auto Specialty Co.

SHOES

INNER TIRE SHOES

(Shoes or Sleeves to be used between outer shoe and inner tube as a protector and reinforcement. For Outer Shoes or Manchons—See Sleeves, Tire Repair)

ACME—See Jackson-Eno Rubber Co.

ALDING—See Alsten & Goulding Co.

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

AMERICAN Rubber Products Co., Austin, Ill.

AMERICAN Rubber & Tire Co., 70-78 Beach St., Akron, O.

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Chemico." (See page 177.)

ATLAS Rubber Co., 226-30 N. Jefferson st., Chicago, Ill.

ATWELL Mfg. Co., 825 N. Main St., Independence, Mo.

BROWNIE—See States Mfg. Co.

BULL DOG—See Pennsylvania Rubber Co.

BULL DOG—See Polson Rubber Co.

CHEMICO—See Atlas Auto Supply Co.

COMPETITION—See Gray Specialty Co.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic." (See page 685.)

COX, David H., Chestnut St., Roselle, N. J.

DOUBLE Fabric Tire Co., 60 W. Ninth St., Auburn, Ind. "Interlock."

DYKES—See Vail Rubber Co.

EGYPTIAN—See Polson Rubber Co.

ESSEX Rubber Co., Trenton, N. J.

EXCEL Rubber Co., Akron, O.

FALLS Rubber Co., Cuyahoga Falls, O.

FARRELL Auto & Supply Co., 1178 Bedford Ave., Brooklyn, N. Y.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

FIRESTONE Tire & Rubber Co., Akron, O.

FISHER Mfg. Co., 1530 N St., Lincoln, Neb.

FLEXSTEEL—See Standard Sales Co.

FORD & Lyon, Fitchburg, Mass. (See page 685.)

GENERAL Tire & Rubber Co., Akron, O. "Vulc-Tite." (See page 531.)

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GRAND Rapids Tire Re-Enforcement Co., Grand Rapids, Mich. "Jewel."

GRAY Specialty Co., 148 Avon Ave., Newark, N. J. "Competition."

HAGSTROM Bros. Mfg. Co., Lindsborg, Kan.

HAMPTON-CAMPBELL Innerliner Co., 1520 W. Washington St., Indianapolis, Ind. "Kant-blo."

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

IDEAL—See Voorhees Rubber Mfg. Co.

INDIA Rubber Tire Co., 1512 S. Michigan Ave., Chicago, Ill.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind. (See page 523.)

INNER Shoe Tire Co., Front & Allen Sts., Grand Rapids, Mich. "Innershu," "Shurhold," "Klincher."

INNERSHU—See Inner Shoe Tire Co.

INTERLOCK—See Double Fabric Tire Co.

INVINCIBLE Tire Co., 53 Sabin St., Providence, R. I.

Complete Index to Classification appears on Pages 8 to 27.

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Hartford

AUTOMOBILE EQUIPMENT

Designed with one object in view—to further comfortable, safe, economical automobiling, and fully realizing that object.

HARTFORD Shock Absorber

Today, as in the first days of the automobile, the most efficient, most generally used absorber of road shocks.

Affords perfect control over an automobile spring. Its frictionally-acting discs assimilate all excessive spring oscillations, all jolts, jars and vibrations, making comfortable riding a happy reality. Will materially improve the riding qualities of any car, adding many years to its life and much mileage to its tires.

Five sizes: $60; $50; $40; $25; Ford type, $16. Mention make, year and model of car when ordering.

HARTFORD CUSHION SPRING

Gives needed resiliency to *both* movements of stiff automobile springs enabling them to carry their load comfortably over smooth or moderately rough roads.

Four models: $25; $22.50; $20; Ford type, $12.

HARTFORD BUMP ABSORBER

The national guard for motor cars. Trim, beautiful in design. Practical in construction. Shock-absorbing, every blow being dissipated by frictionally shock-absorbing spring leaves. Adds to the beauty of any make of car. Projects straight from frame, giving a pleasing, streamline effect. Bolts on without drilling.

Three models: $12; $10; Ford, $8.00. Nickel finish, $1.00 extra.

HARTFORD AUTO JACK

Every one of the many thousands who use it is a booster of its extraordinary merits. Solid, smooth-acting steel gears, strong malleble iron case handsomely finished in black and gold. Positively *the* easiest-working of auto jacks. A wrist movement lifts the heaviest of cars. In canvas bag container. $6.50.

E. V. HARTFORD ELECTRIC BRAKE

Modernizes a motor car up-to-the-minute. No muscular effort required. A handy lever, on steering wheel, controls it. Smooth and positive braking results over the full range of braking action, from gradual to almost instantaneous stoppage. Price, $90.

RED RACK JACK

Can be slipped under axle, reversed from lifting to lowering movement, removed, without crawling or sprawling on part of operator. 26-inch handle which folds. Lighter than other jacks of its type yet stronger. Stylish, distinctive design—"all black but the rack; it's red." Price $2.50 ($3.00 west of Rockies).

Edward V. Hartford, Inc., 172 Morgan St., Jersey City, N. J.

Branches: New York, Boston, Chicago. Distributors in principal cities. Dealers everywhere.

Makers of the Hartford Shock Absorber, Hartford Cushion Spring, E.V. Hartford Electric Brake, Hartford Auto Jack, Hartford Bump Absorber, Red Rack Jack.

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SHOES (Continued)

INNER TIRE SHOES (Continued)

JACKSON-ENO Rubber Co., 1010 S. Main St., Los Angeles, Cal. "Acme," "Peerless," "Samson," "Leech."

JEWEL—See Grand Rapids Tire Re-Enforcement Co.

K & W Rubber Co., Orange St., Ashland, O. "Maxotire."

KANT-BLO—See Hampton-Campbell Innerliner Co.

KEYSTONE Rubber Mfg. Co., Erie, Pa. (See page 521.)

KLINCHER—See Inner Shoe Tire Co.

LAFAYETTE Tire Co., 511-13 N. Ninth St., Lafayette, Ind. "Red Cross."

LEATHER Tire Goods Co., Niagara Falls, N. Y. "Woodworth." (See pages 82 and 83.)

LEE Tire & Rubber Co., Conshohocken, Pa.

LEECH—See Jackson-Eno Rubber Co.

LION Liner Co., 1219 N. Eighth St., Sheboygan, Wis.

M. & M. Mfg. Co., Miami St., Akron, O. Norka."

MARSHALL Tire Co., 79 Purchase St., Fall River, Mass.

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MAXOTIRE—See K & W Rubber Co.

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

MILLER Rubber Co., Akron, O.

MISSOURI Rubber Mfg. Co., 936 N. Kingshighway, St. Louis, Mo.

MODEL—See Voorhees Rubber Mfg. Co.

NEMO Chemical & Specialty Mfg. Co. Thompson Bldg., Chicago, Ill. "Rough Rider."

NEW Life Reliner Co., 499 Date St., San Diego, Cal.

NORKA—See M. & M. Mfg. Co.

O'NEIL Tire & Rubber Co., W. Exchange & Water Sts., Akron, O.

PEERLESS—See Jackson-Eno Rubber Co.

PEERLESS—See Polson Rubber Co.

PEERLESS Cement Co., 39 Viaduct, Akron, O.

PENNSYLVANIA Rubber Co., Jeannette, Pa. "Bull Dog."

POLSON Rubber Co., 331 Southwest Blvd., Kansas City, Mo. "Bull Dog," "Egyptian," "Peerless."

PORTAGE Rubber Co., Barberton, O.

QUAKER City Rubber Co., Philadelphia, Pa. (See page 839.)

RED CROSS—See Lafayette Tire Co.

REINFORCED Innertube Co., Brocton, Mass.

RIM-GRIP—See Western Auto Sub-Casing Co.

ROUGH RIDER—See Nemo Chemical & Specialty Mfg. Co.

RUTHERFORD Rubber Co., Rutherford, N. J.

SAMSON—See Jackson-Eno Rubber Co.

SAVAGE Tire Co., Main & Sicard Sts., San Diego, Cal.

SECURITY Blow-out Holder Mfg. Co., Leggett Bldg., Fairfield, Ia.

SHUR-HOLD—See Inner Shoe Tire Co.

SIERRA—See Sturges Co.

STANDARD Sales Co., Hippodrome Bldg., Cleveland, O. "Flexsteel."

STAR—See States Mfg. Co.

STATES Mfg. Co., 1029-37 W. Adams St., Chicago, Ill. "Brownie," "Star."

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal. "Sierra."

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

TOLEDO-FINDLAY Tire & Rubber Co., Western Ave., Findlay, O.

TWENTIETH Century Tire Protector Co., Midlothian, Tex.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

UNIVERSAL Chemical Co., 1230 Parker Ave., Indianapolis, Ind.

VAIL Rubber Co., 142-44 W. 27th St., Chicago, Ill. "Dykes."

VITALIC—See Continental Rubber Works.

VOORHEES Rubber Mfg. Co., Jersey City, N. J. "Ideal," "Model."

VULC-TITE—See General Tire & Rubber Co.

VULCANIZED Products Co., Muskegon, Mich.

VULTITE Rubber Co., Bridgeport, Conn. (See page 797.)

WABAN Webbing Co., 207 Essex St., Boston, Mass.

WEARWELL Rubber Co., Kokomo, Ind.

WESTERN Auto Sub-Casing Co., 1044 S. Los Angeles St., Los Angeles, Cal. "Rim-Grip."

WOODWORTH—See Leather Tire Goods Co.

ZEE ZEE Tire & Rubber Co., 33d & Walnut Sts., Philadelphia, Pa.

SIGHT-FEEDS

INDEPENDENT SIGHT-FEEDS

AMERICAN Brass & Iron Co., Detroit, Mich. (See page 183.)

CRUM-WILEY Mfg. Co., Peru, Ind.

ESSEX Brass Co., G. B., 430-36 Franklin St., Detroit, Mich.

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

KRAHN Mfg. Co., 588 Clinton St., Milwaukee, Wis.

LAVIGNE Mfg. Co., 625-41 Commonwealth Ave., Detroit, Mich.

LEE Co., Wm. O., Port Huron, Mich.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill. (See page 735.)

MICHIGAN Lubricator Co., 661-73 Beaubien St., Detroit, Mich.

MORRIS Co., George W., 1135 Main St., Racine, Wis.

PEDERSEN Lubricator Co., 636 First Ave., New York, N. Y.

Complete Index to Classification appears on Pages 8 to 27.

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Built Like an Elgin

tells the story of VAN SICKLEN Speedmeters—built by Elgin watchmakers in the Elgin factory.

The precision, service, efficiency and beauty of VAN SICKLEN Speedmeters is the logical result of half a century of experience in making fine watches.

The advanced pneumatic principle on which

VAN SICKLEN SPEEDMETERS

operate, their rapid re-set, forward or back, enabling you to pick up trip mileage at any intermediate point, their large, easily read figures, account for VAN SICKLEN popularity and widespread use as standard equipment on cars of highest standing.

VAN SICKLEN AUTOMATIC HEAD LIGHT CONCENTRATOR FOR FORD CARS

As it looks installed under head

Bright Light at Lowest Speeds

This wonderful device should be on every 1915-16 model Ford. At any speed below 15 miles per hour it automatically disconnects the right headlight shunting **double current** into the left headlight. This enables the left headlight to supply a light bright enough for every purpose.

Above 15 miles per hour the regular Ford two-lamp system automatically re-asserts itself. At 13 m.p.h. the left headlight burns as brightly as it would ordinarily at 26 m.p.h.

No danger of injuring magneto or burning out either bulb. Automatic, troubleproof, easily installed on dash under hood.

Complete, ready for use, $2. Full instructions with each Concentrator. Write for booklet, FREE.

THE VAN SICKLEN CO., 14 Chicago, St., Elgin, Ill.

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SIGHT-FEEDS (Continued)

INDEPENDENT SIGHT-FEEDS (Continued)

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 781.)

UNITED States Gauge Co., New York, N. Y. (See page 237.)

WILKINSON Co., Wm. H., West Medway, Mass.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

SIGNALS

REAR TRAFFIC SIGNALS

ARMANLITE—See Auto Signal & Equipment Co.

AUTO Accessory Mfg. Co., 1109-13 Sixth St., Racine, Wis.

AUTO Direction Signal Co., 505 Fifth Ave., New York, N. Y. "Walz."

AUTO Signal & Equipment Co., Ellicott Sq. Bldg., Buffalo, N. Y. "Armanlite."

AUTO Specialty & Signal Co., 2642 S. Michigan Ave., Chicago, Ill. "Safeguard."

BAER Mfg. Co., North American Bldg., Philadelphia, Pa.

BROWNELL, F. A., 6 Portsmouth Terrace, Rochester, N. Y. "Universal."

COWLES & Co., C., New Haven, Conn. (See page 257.)

DRABOLD & Mott, 1090 Vermont St., Detroit, Mich.

GEM Mfg. Co., Goebel & Fulton Sts., Pittsburg, Pa. "Quartette."

NEVEROUT—See Rose Mfg. Co.

NOKOLYD Signal Co., 40 W. 13th St., New York, N. Y. (See page 823.)

ONA-MOTO-LITE Co., Cleveland, O.

QUARTETTE—See Gem Mfg. Co.

QUARTETTE Automobile Signal Co., Hibernian Bldg., Los Angeles, Cal.

R. & L. Instrument Co., Beloit, Wis. (See page 855.)

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

ROTHERMICH, A. P., 2915 N. Taylor Ave., St. Louis, Mo.

SAFEGUARD—See Auto Specialty & Signal Co.

SAFETY Auto Signal Co., Abbott Bldg., Philadelphia, Pa.

SAFETY Signal Device Co., 35 W. Congress St., Detroit, Mich.

SCOTT—See Specialty Device Co.

SPECIALTY Device Co., 112 W. Third St., Cincinnati, O. "Scott."

STANDARD Signal Lamp Co., Sanford Bldg., Bridgeport, Conn.

TRAFFIC Safety Device Co., 1133 Broadway, New York, N. Y.

UNIVERSAL—See Brownell, F. A.

WALZ—See Auto Direction Signal Co.

SILK

SPOOL SILK

MEYER & Co., John C., Lowell, Mass.

SAUQUOIT Silk Mfg. Co., Philadelphia, Pa.

UPHOLSTERY SILK

CHENEY Bros., South Manchester, Conn.

SAUQUOIT Silk Mfg. Co., Philadelphia, Pa.

SKIDS

CAR RAISING SKIDS

(For facilitating repair work or cleaning—used as a substitute for a pit)

MONTOUR Steel Co., Montour Falls, N. Y.

SLEEVES

TIRE REPAIR SLEEVES OR BANDS

(For lacing or strapping around a tire to close a puncture or blowout. For Sleeves to be used between inner tube and outer shoe—See Shoes, Inner Tire)

ALDING—See Alsten & Goulding Co.

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

AMERICAN Chain Co., Bridgeport, Conn. "Dobbins." (See page 157.)

AMERICAN Rubber Products Co., Austin, Ill.

ATLAS Rubber Co., 226-30 N. Jefferson St., Chicago, Ill.

BADGER Handle Co., 323 E. Water St., Milwaukee, Wis.

BRICTSON Mfg. Co., Brookings, S. Dak.

BULL DOG—See Polson Rubber Co.

BULL MOOSER—See Nemo Chemical & Specialty Mfg. Co.

CENTURY—See Nemo Chemical & Specialty Mfg. Co.

CHICAGO Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill. "Krome."

COLORADO Tire & Leather Co., Tread Bldg., Denver, Colo. "Durable."

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic." (See page 685.)

COOK & Bro., E. C., 1301-45 Carroll Ave., Chicago, Ill.

COX, David H., Chestnut St., Roselle, N. J.

DOBBINS—See American Chain Co.

DOUBLE Fabric Tire Co., 60 W. Ninth St., Auburn, Ind. "Jumbo."

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Warner Auto-Meter $50 to $200

Stewart Vacuum System $10

Stewart Speedometer for Ford and Saxon Cars $10

Stewart Motor Driven Warning Signal $6

Stewart Speedometer $25 up

Sell Only

Stewart

Products

No Others Will Satisfy You

Sell Stewart accessories and you will never need to explain their prestige, their quality, their desirability.

Everybody knows that name Stewart and knows that 95% of all car manufacturers use Stewart Products: Stewart Speedometer, Stewart Warning Signal, Stewart Vacuum System, and Stewart Tire Pump.

Stewart Service Stations are so thoroughly distributed over this country that your customers will agree that Stewart Service is on a par with Stewart quality and serviceability.

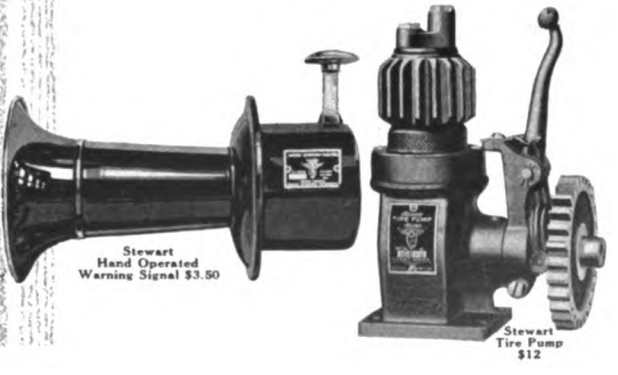
Car owners know that putting cheap, unreliable accessories on their cars is costly economy.

No other accessories will satisfy you because no others will satisfy your customers.

Stewart Products for sale by accessory dealers, automobile dealers and garages—everywhere

Branches and Service Stations in all Principal Cities

The Stewart-Warner Speedometer Corp.
Chicago, Ill., U. S. A.



Stewart Hand Operated Warning Signal $3.50

Stewart Tire Pump $12

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SLEEVES (Continued)

TIRE REPAIR SLEEVES OR BANDS (Continued)

DURABLE—See Colorado Tire & Leather Co.

DYKES—See Vail Rubber Co.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ESSEX Rubber Co., Trenton, N. J.

EVERLASTING—See Legnard & Co.

EXCEL Rubber Co., Akron, O.

FALLS Rubber Co., Cuyahoga Falls, O.

FARRELL Auto & Supply Co., 1178 Bedford Ave., Brooklyn, N. Y.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

FIRESTONE Tire & Rubber Co., Akron, O.

FISHER Mfg. Co., 1530 N St., Lincoln, Neb.

FORD & Lyon, Fitchburg, Mass. (See page 685.)

G & K—See Graton & Knight Mfg. Co.

GENERAL Tire & Rubber Co., Akron, O. (See page 531.)

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K." (See page 103.)

GRAY Specialty Co., 148 Avon Ave., Newark, N. J.

HAGER & Son, Chas., 1876 Broadway, New York, N. Y.

IDEAL—See Voorhees Rubber Mfg. Co.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind. (See page 523.)

INNER Shoe Tire Co., Front & Allen Sts., Grand Rapids, Mich.

JACKSON-ENO Rubber Co., 1010 S. Main St., Los Angeles, Cal.

JUMBO—See Double Fabric Tire Co.

K & W Rubber Co., Orange St., Ashland, O.

KEYSTONE Rubber Mfg. Co., Erie, Pa. (See page 521.)

KIMBALL Tire Case Co., 168 Broadway, Council Bluffs, Ia.

KROME—See Chicago Rawhide Mfg. Co.

LAFAYETTE Tire Co., 511-13 N. Ninth St., Lafayette, Ind. "Red Cross."

LEATHER Tire Goods Co., Niagara Falls, N. Y. (See pages 82 and 83.)

LEE Tire & Rubber Co., Conshohocken, Pa.

LEGNARD & Co., A. B., Waukegon, Ill. "Everlasting."

M. & M. Mfg. Co., Miami St., Akron, O.

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MESINGER Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

MICHELIN Tire Co., Milltown, N. J. (See Inside Back Cover.)

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

MISSOURI Rubber Mfg. Co., 936 N. Kingshighway, St. Louis, Mo.

MODEL—See Voorhees Rubber Mfg. Co.

NATIONAL Leather Belting Co., 342 E. 38th St., New York, N. Y.

NEMO Chemical & Specialty Mfg. Co., Thompson Bldg., Chicago, Ill. "Bull Mooser," "Century."

O'NEIL Tire & Rubber Co., W. Exchange & Water Sts., Akron, O.

PEERLESS Cement Co., 89 Viaduct, Akron, O.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

POLSON Rubber Co., 331 Southwest Blvd., Kansas City, Mo. "Bull Dog."

PORTAGE Rubber Co., Barberton, O.

RED CROSS—See Lafayette Tire Co.

RUGG & Co., E. L., Newark, O. (See page 811.)

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal.

TWENTIETH Century Tire Protector Co., Midlothian, Tex.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

UNIVERSAL Tire Protector Co., Angola, Ind.

VAIL Rubber Co., 142-44 W. 27th St., Chicago, Ill. "Dykes."

VITALIC—See Continental Rubber Works.

VOORHEES Rubber Mfg. Co., Jersey City, N. J. "Model," "Ideal."

VULTITE Rubber Co., Bridgeport, Conn. (See page 797.)

WEARWELL Rubber Co., Kokomo, Ind.

SOAPS

AUTOMOBILE SOAPS

(See also Polishes, Automobile)

ALDING—See Alsten & Goulding Co.

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

AMALIE—See Sonneborn Sons.

AMBERZO—See Columbia Refining Co.

AMERICAN CROWN—See Kirk & Co.

AMERICAN Oil Co., Jackson, Mich. "Amoco."

AMERICAN Oil & Disinfectant Co., 196 Water St., New York, N. Y.

AMERICAN Soap & Washoline Co., 140-80 Central Ave., Cohoes, N. Y. "Apollo."

AMOCO—See American Oil Co.

APOLLO—See American Soap & Washoline Co.

ARCOLINE—See Atlantic Refining Co.

ARMOUR Soap Works, 31st Pl. & Benson St., Chicago, Ill. "Lustro."

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup." (See page 179.)

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Century."

ATLANTIC Refining Co., Euclid Ave. & E. 65th St., Cleveland O. "Arcoline."

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Foremost
in
Design
and
Dependability

WESTON-MOTT
AXLES
FLINT, MICH.

The material used in the manufacture of our axles, hubs and rims must measure up to the highest possible standard, otherwise IT IS REJECTED.

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SOAPS (Continued)

AUTOMOBILE SOAPS (Continued)

AUTO-KING—See Lautz Bros. & Co.

AUTO Oil Co., 172 S. Water St., Jackson, Mich.

BALKAN—See Jones & Bro.

BANNER Chemical Co., 2301 15th St., Denver, Colo.

BATOLA—See Monahan Antiseptic Co.

BAUM'S Castorine Co., 104 N. George St., Rome, N. Y.

BE-BE-Co.—See Boston Blacking Co.

BELL Oil Co., 53 E. Ferry St., St. Louis, Mo. "Liberty Bell."

BLUE RIBBON—See International Metal Polish Co.

BOSTON Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

BUCK & Co., E. A., Worcester, Mass. "Powero."

BUCKEYE—See Davies-Young Soap Co.

CENTURY—See Arnstein, Eugene.

CHARIOT—See Fiske Bros. Refining Co.

CHEMICAL Supply Co., E. 93d St. S. E. & Erie R. R., Cleveland, O.

CINCINNATI Oil Works Co., 525 Eggleston Ave., Cincinnati, O.

CLEANEASY—See Winn, Wm. R.

CLENZO—See Puritan Oil Co.

COLGATE & Co., 199 Fulton St., New York, N. Y. "Moto Bright."

COLUMBIA Refining Co., 90 West St., New York, N. Y. "Amberzo."

DAVEY & Co., 2600 Grand Ave., Chicago, Ill.

DAVIES-YOUNG Soap Co., Findlay St. & Big Four R. R., Dayton, O. "Buckeye."

DETROIT White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.

DIAMOND Specialty Co., Indianapolis, Ind.

DUPLEX—See Enterprise Oil Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Superior."
(See pages 189 to 192.)

EAGLE Oil & Supply Co., Boston, Mass. "Eoco."
(See page 827.)

EASTERN Supply Co., Hammond & Canterbury Sts., Worcester, Mass.

EAVENSON & Sons, J., Delaware & Penn Sts., Camden, N. J. "Jesco."

ENERGINE Refining & Mfg. Co., The Arcade, Cleveland, O.

ENTERPRISE Oil Co., 164 Chandler St., Buffalo, N. Y. "Duplex."

EOCO—See Eagle Oil & Supply Co.

ERICKA Mfg. Co., 332 Liberty St., Springfield, Mass.

FAIRCHILD & Bro., M. H., 6 W. Austin Ave., Chicago, Ill.

FAULTLESS—See Hawkeye Oil Co.

FISK Mfg. Co., Springfield, Mass.

FISKE Bros. Refining Co., 24 State St., New York, N. Y. "Chariot."

FORD & DENNEN—See Richmond & Co.

FRAZER Lubricator Co., 3921 Normal Ave., Chicago, Ill.

GOOD, James, 939-41 N. Front St., Philadelphia, Pa.

GREAT Western Oil Co., 2855 E. 37th St., Cleveland, O.

GREEN LION—See Puritan Soap Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HARRAL Soap Co., 132-36 Havemeyer St., Brooklyn, N. Y. "Kleeneasy."

HARRIS Oil Co., A. W., 326 S. Water St., Providence, R. I.

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HAWS, Geo. A., 142-44 Front St., New York, N. Y. "Panhard."
(See page 353.)

HERCULES Chemical Works, 2138 W. Van Buren St., Chicago, Ill. "Non-Such."

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Whizoil."

HOUGHTON & Co., E. F., 240 W. Somerset St., Philadelphia, Pa.

INTERNATIONAL Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

INTERSTATE Chemical Co., 12-20 Bayview Ave., Jersey City, N. J.

INVADER Oil Co., 80 Broad St., New York, N. Y.
(See page 467.)

JESCO—See Eavenson & Sons.

JEWEL—See Wadsworth-Howland Co.

JONES & Bro., J., 429 Locust St., Philadelphia, Pa. "Balkan."

KENNEY Mfg. Co., F., 360-68 Dorchester Ave., Boston, Mass.

KIRK & Co., James S., 106 E. Austin Ave., Chicago, Ill. "American Crown."

KLEENEASY—See Harral Soap Co.

KLENO Mfg. Co., North Weymouth, Mass.

LAYTON Park Oil & Soap Co., M. & M. Bank Bldg., Milwaukee, Wis.

LAUTZ Bros. & Co., Hanover, Lake & Lloyd Sts., Buffalo, N. Y. "Auto-King."

LIBERTY BELL—See Bell Oil Co.

LIN-O—See Struns & Son.

LOOS & Dilworth, 134 S. Front St., Philadelphia, Pa.

LUSTRO—See Armour Soap Works.

McLEAN-JONES Oil & Supply Co., 40 India Wharf, Boston, Mass.

MAGIC—See Zurn Co.

MARATHON—See Weinberg & Co.

MASTER—See Pure Oil Co.

MIDDLE STATES Oil Co., Engineers Bldg., Cleveland, O.

MILLER'S Sons, Wm. P., 298-302 Hancock St., Long Island City, N. Y. "Pan-O-Lite."

MILLERS Sons Co., A. D., Columbus & Preble Aves., Pittsburg, Pa. "Perfection."

MOBO—See Stanley, John T.

MONAHAN Antiseptic Co., 166-72 N. Curtis St., Chicago, Ill. "Simplex," "Batola."

MONARCH Mfg. Co., Council Bluffs, Ia.

MONOGRAM—See New York Lubricating Oil Co.

MOORE Oil Co., York St. & McLean Ave., Cincinnati, O.

MOTO BRIGHT—See Colgate & Co.

Complete Index to Classification appears on Pages 8 to 27.

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Sears-Cross

Absolutely Accurate

Spedindicator

Mechanical Type

Announcement To The Trade

BEGINNING in February, and running throughout the year 1916, Sears-Cross advertising will appear in the LEADING FARM JOURNALS; the big Sunday NEWSPAPERS and the PROMINENT TRADE PUBLICATIONS in the United States.

This big campaign will tell the story of Sears-Cross products to millions of people. It will also tell some startling truths about Mechanical Horns, and various types of Speedometers. Included in the list of publications is a circulation that will reach 16,000,000 people.

How many of them are your customers?

Dealers—ask your jobbers to explain the Sears-Cross Sales Campaign to you.

Manufacturers—we have a proposition that will interest you.

Factory, BUSH TERMINAL, Brooklyn, New York

Branches—Chicago, Detroit, Kansas City. Service Stations in all principal cities of the United States and Dominion of Canada.

Sears-Cross

Thunder Horn

Mechanical Type

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SOAPS (Continued)

AUTOMOBILE SOAPS (Continued)

MURPHYS—See Phoenix Oil Co.

NATIONAL Oil Products Co., 15 Bergen St., Harrison, N. J.

NATIONAL Oil & Supply Co., 180 Frelinghuysen Ave., Newark, N. J. "Viscos."

NATIONAL Refining Co., Rose Bldg., Cleveland, O.

NEW YORK Lubricating Oil Co., New York, N. Y. "Monogram."

NON-SUCH—See Hercules Chemical Works.

PAN-O-LITE—See Miller's Sons.

PANHARD—See Haws, Geo. A.

PARKER Refining Co., 1307 W. 11th St., Cleveland, O.

PERFECTION—See Millers Sons Co.

PERFECTION—See Warren Refining & Chemical Co.

PHOENIX Oil Co., 2554 W. Fifth St., Cleveland, O. "Murphys."

PIONEER Mfg. Co., Harvard Ave. & E. 103d St., Cleveland, O. "Shino."

POWERO—See Buck & Co.

PREMIUM—See Puritan Soap Co.

PURE Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Puritan," "Master."

PURITAN—See Pure Oil Co.

PURITAN Oil Co., 1218 W. 70th St., Cleveland, O. "Clenzo."

PURITAN Soap Co., 500 Exchange St., Rochester, N. Y. "Premium."

REXINE Co., Sheboygan, Wis. (See page 811.)

RICHMOND & Co., C. C., 40 Batterymarch St., Boston, Mass. "Ford & Dennen."

SHINO—See Pioneer Mfg. Co.

SIMPLEX—See Monahan Antiseptic Co.

SLIKUP—See Arnold, N. B.

SONNEBORN Sons, L., 262 Pearl St., New York, N. Y. "Amalie."

SPEARE'S Sons Co., Alden, 140 Sixth St., Boston, Mass.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STANDARD Oil Co. of N. Y., 26 Broadway, New York, N. Y.

STANLEY, John T., 642 W. 30th St., New York, N. Y. "Mobo."

STRUNZ & Son, S., 708 Bingham St., Pittsburg, Pa. "Lin-O."

SULLIVAN Oil Co., 418 Wells St., Chicago, Ill.

SUPERIOR—See Durkee-Atwood Co.

SUPERIOR Oil Co., Century Bldg., Cleveland, Ohio.

TROPICAL Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O.

VAN TILBURG Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

VISCOS—See National Oil & Supply Co.

WADHAMS Oil Co., Milwaukee, Wis. "Woco."

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WANG—See Van Tilburg Oil Co.

WARREN Refining & Chemical Co., Cleveland, O. "Perfection."

WASHZUM—See White & Bagley Co.

WEINBERG & Co., J. H., 128 Maiden Lane, New York, N. Y. "Marathon."

WHITE & Bagley Co., Worcester, Mass. "Washzum." (See page 611.)

WHIZOIL—See Hollingshead Co.

WINN, Wm. R., 143 Maiden Lane, New York, N. Y. "Cleaneasy."

WOCO—See Wadhams Oil Co.

WONDER WORKER—See Hall-Thompson Co.

YOUNG, Orlando W., 180 Sherman Ave., Newark, N. J.

ZURN Co., O. F., 2736-38 N. Broad St., Philadelphia, Pa. "Magic."

HAND SOAPS AND PASTES

AFFINITY Co., Woodmen Bldg., Omaha, Neb.

ALDING—See Alsten & Goulding Co.

ALSTEN & Goulding Co., 36 Foster St., Worcester, Mass. "Alding."

AMERICAN Soap & Washoline Co., 140-80 Central Ave., Cohoes, N. Y.

ARMOUR Soap Works, 31st Pl. & Benson St., Chicago, Ill.

ARNOLD, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup." (See page 179.)

ATWELL Mfg. Co., 825 N. Main St., Independence, Mo.

BARRABEE & Jones, 46 Columbus Ave., Boston, Mass. "Nu-Find."

BE-BE-CO.—See Boston Blacking Co.

BLUE RIBBON—See International Metal Polish Co.

BLUE Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Peerless," "Premium."

BOSTON Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

BRADLEE-WOOD Co., 3 E. 14th St., New York, N. Y. "E-Z-E."

CHAMPION—See Gardner & Co.

CLAIRE Mfg. Co., 336-38 W. 63d St., Chicago, Ill. "Jinx."

CLEAN-PAW—See Frost, F. E.

CLEANEASY—See Winn, Wm. R.

CLEANUP—See Flash Chemical Co.

CLEANZUM—See White & Bagley Co.

COLGATE & Co., 199 Fulton St., New York, N. Y.

CORLISS Supply Co., 1906 Olive St., St. Louis, Mo.

DERMALENE—See Northwestern Chemical Co.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Me." (See pages 189 to 192.)

E-Z-E—See Bradlee-Wood Co.

EASTERN Supply Co., Hammond & Canterbury Sts., Worcester, Mass. "Use Me."

EAVENSON & Sons, J., Delaware & Penn Sts., Camden, N. J. "Jesco."

ERICKA Mfg. Co., 882 Liberty St., Springfield, Mass. "Itsafine."

FAULTLESS—See Hawkeye Oil Co.

FIEBING Chemical Co., 238-40 Reed St., Milwaukee, Wis. "Presto."

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WICO HAND SOAP

WICO XXXX

HAS NO EQUAL AS A GREASE SOLVENT

Contains no Grit, Acid or Alkali

Removes grease, oil, paint, tar without injury to the most delicate skin or the finest fabric. Can be used with or *without water*. Sold only through the jobbing trade. Liberal proposition—write for it.

Here is an article with a wide field and an established demand.

Williams Manufacturing Company
Columbus, Ohio

Puts Noisy Gears to Sleep

I-O-C Gear Oil is the *only oil* ever made especially and exclusively for the lubrication of sliding gear transmissions and differential gears.

It is a heavy dark fluid lubricant which possesses certain peculiar properties that causes it to face the gear teeth with a coating which is practically indestructible, and prevents wear and reduces noise and friction to a minimum.

It contains no foreign matter such as ground cork, saw dust, etc., but is 100 PER CENT OIL, and being free from water and chemicals it will not foam in the gear case when running, or allow the bearings to rust when idle.

A trial will convince the most skeptical that I-O-C Gear Oil is the most practical and economical gear lubricant in the world.

INVADER OIL CO.

80 Broad St., N. Y. City
113 Arch St., Philadelphia

Trucks

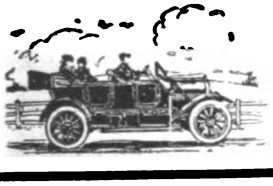
Aeroplanes

The Bush Manufacturing Co.

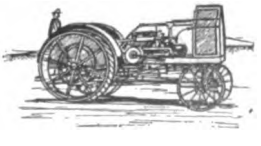
Hartford, Conn.

RADIATORS
HOODS
TANKS

Automobiles



Tractors



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SOAPS (Continued)

HAND SOAPS AND PASTES (Continued)

FINGA-BRITE—See Rath Mfg. Co.

FLASH Chemical Co., Kendall Sq., Boston, Mass. "Cleanup."

FRAZER Lubricator Co., 3921 Normal Ave., Chicago, Ill.

FROST, F. E., 505 Main St., Worcester, Mass. "Kuick Klean," "Clean-Paw," "Zip."

GARDNER & Co., 222 E. 34th St., New York, N. Y. "Champion."

GIT Mfg. Co., 92 Franklin St., Westfield, Mass.

GRE-SOLVENT—See Utility Co.

GRIM-OFF—See Pitts Sanitary Co.

GRIME-OFF—See Pacific Coast Borax Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HAND-I-WASH—See Tay-Miller Mfg. Co.

HANDY—See Weinberg & Co.

HARRAL Soap Co., 132-36 Havemeyer St., Brooklyn, N. Y. "Kleeneasy."

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HOLLINGSHEAD Co., R. M., 112 N. Ninth St., Camden, N. J. "Krystal Soiloff."

IMP—See Rath Mfg. Co.

INTERNATIONAL Metal Polish Co., Quill St., & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

ITSAFINE—See Ericka Mfg. Co.

JESCO—See Eavenson & Sons.

JEWEL—See Wadsworth-Howland Co.

JINX—See Claire Mfg. Co.

KL-ENS-OL—See Northwestern Chemical Co.

KLEENEASY—See Harral Soap Co.

KLENO Mfg. Co., North Weymouth, Mass.

KRYSTAL SOILOFF—See Hollingshead Co.

KUICK-KLEAN—See Frost, F. E.

LAVA—See Waltke & Co.

MILLER'S Sons, Wm. P., 298-302 Hancock St., Long Island City, N. Y. "P-O-L."

MILMORE Corp., South Bend, Ind.

MIONE Mfg. Co., Collingdale, Pa.

MOBO—See Stanley, John T.

MONAHAN Antiseptic Co., 166-72 N. Curtis St., Chicago, Ill.

MONOGRAM—See New York Lubricating Oil Co.

NEW YORK Lubricating Oil Co., New York, N. Y. "Monogram."

NORTHWESTERN Chemical Co., Marietta, O. "Dermalene," "Kl-Ens-Ol."
(See pages 172 and 173.)

NU-FIND—See Barrabee & Jones.

PACIFIC Coast Borax Co., 199 William St., New York, N. Y. "Grime-off."

PEERLESS—See Blue Ribbon Mfg. Co.

PEX Products Co., Buffalo, N. Y.

PITTS Sanitary Co., Newport, R. I. "Grim-off."

P-O-L—See Miller's Sons.

PREMIUM—See Blue Ribbon Mfg. Co.

PRESTO—See Fiebing Chemical Co.

RADIUM Compound Co., Phoenix, N. Y.

RATH Mfg. Co., Hedley & Richmond Sts., (Frankford), Philadelphia, Pa. "Finga-Brite," "Imp."

REXINE Co., Sheboygon, Wis.
(See page 811.)

RIE-NIE—See Durkee-Atwood Co.

ROBERTSON Vanco Co., 103 Park Ave., New York, N. Y. "Vanco."

SHOFO—See Stanley, John T.

SKIDOO—See Yeazell-Goldstein Corp.

SLIKUP—See Arnold, N. B.

SPEE-DEE—See States Chemical Co.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STANLEY, John T., 642 W. 30th St., New York, N. Y. "Shofo," "Mobo."

STATES Chemical Co., 656 W. Austin Ave., Chicago, Ill. "Spee-Dee."

TATLOCK Bros., Rochester, N. Y. "Tat's."

TAT'S—See Tatlock Bros.

TAY-MILLER Mfg. Co., 1712 Cherry St., Phila delphia, Pa. "Hand-I-Wash."

UKO—See Utility Co.

UNIVERSAL Chemical Co., 1230 Parker Ave., Indianapolis, Ind. "Uzum."

UNO Mfg. Co., Royal Ins. Bldg., Chicago, Ill.

USE ME—See Eastern Supply Co.

UTILITY Co., 636 W. 44th St., New York, N. Y. "Gre-Solvent," "Uko."

UZUM—See Universal Chemical Co.

VANCO—See Robertson Vanco Co.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WALTKE & Co., Wm. E., Grand Ave. & Second St., St. Louis, Mo. "Lava."

WEINBERG & Co., J. H., 128 Maiden Lane, New York, N. Y. "Handy."

WHITE & Bagley Co., Worcester, Mass. "Cleansum."
(See page 611.)

WICO—See Williams Mfg. Co.

WILLIAMS Mfg. Co., Columbus, O. "Wico."
(See page 467.)

WINN, Wm. R., 143 Maiden Lane, New York, N. Y. "Cleaneasy."

WONDER WORKER—See Hall-Thompson Co.

YEAZELL-GOLDSTEIN Corp., 489 Buttles Ave., Columbus, O. "Skidoo."

ZIP—See Frost, F. E.

SOCKETS

BOW SOCKETS

(For Slat Irons—See Irons, Slat)

AJAX—See Cortland Forging Co.

ASHTABULA Bow Socket Co., Ashtabula, O.

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

CORTLAND Carriage Goods Co., 115 Pt. Watson St., Cortland, N. Y.

CORTLAND Forging Co., Cleveland St., Cortland, N. Y. "Ajax."

Complete Index to Classification appears on Pages 8 to 27.

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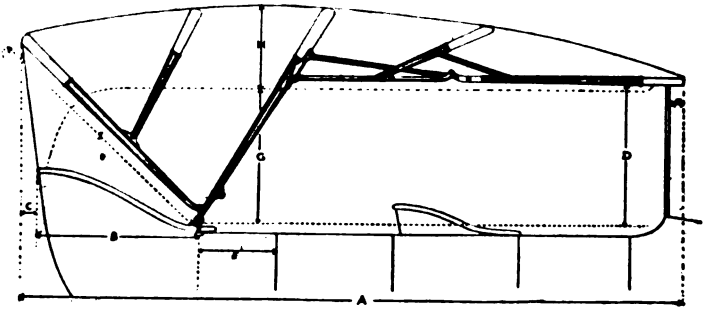
Pioneer One-Man Top Sockets

The "PIONEER" is a real One-Man Top that does not require a book of instructions to operate. The movement is controlled in all positions and its mechanical construction combines stability and lightness, with pleasing lines.

The double strut overcomes friction in operating the top, and permits of close folding. "PIONEER" One-Man Tops do not rattle, buckle or sag, and afford ample clearance for the passenger.

Send for dimension blanks and estimate.



CRANDAL, STONE & CO.

BINGHAMTON :: :: :: :: :: N. Y.

Syracuse Malleable Iron Works

SYRACUSE, N. Y.

MALLEABLE CASTINGS GREY IRON

MALLEABLE CASTINGS

FOR AUTOMOBILE PARTS

True to Patterns
And of Highest Tensile Strength

LARGE CAPACITY
PROMPT DELIVERIES

The right kind of castings for the right kind of car.
Write and let us get together on your requirements.

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SOCKETS (Continued)

BOW SOCKETS (Continued)

CRANDAL, Stone & Co., Binghamton, N. Y. "Pioneer."
(See page 469.)

DESOCO—See Detroit Socket Co.

DETROIT Forging Co., 120 Mt. Elliott St., Detroit, Mich. "Mascot."

DETROIT Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

MASCOT—See Detroit Forging Co.

PIONEER—See Crandal, Stone & Co.

SCHERER & Co., H., Detroit, Mich.

SHARRER Patent Top Co., 245 W. 55th St., New York, N. Y.

ELECTRIC LAMP SOCKETS

AID Mfg. Co., 2625 Stewart Ave., Chicago, Ill.

ANCHOR—See Metal Specialties Mfg. Co.

CHICAGO Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

FRANCO—See Interstate Electric Novelty Co.

GENERAL Electric Co., Schenectady, N. Y.

HANDY—See Chicago Electric Mfg. Co.

INTERSTATE Electric Novelty Co., 104 S. Fourth St., Brooklyn, N. Y. "Franco."

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Anchor."
(See page 257.)

MORSE, Frank W., 293 Congress St., Boston, Mass.
(See page 517.)

SPEEDOMETERS

A. W. T.—See American Watch Tool Co.

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

AMERICAN Watch Tool Co., Elm St., Waltham, Mass. "A. W. T."

CLEVELAND Speed Indicator Co., 1905 W. 112th St., Cleveland, O.

CORBIN BROWN—See Corbin Screw Corp.

CORBIN Screw Corp., New Britain, Conn. "Corbin Brown."
(See page 831.)

DETROIT Instrument Co., 251 E. Jefferson Ave., Detroit, Mich.

EVEREADY—See American Ever Ready Works.

GARFORD Mfg. Co., Elyria, O.
(See page 753.)

HOFFECKER Co., Garden Bldg., Boston, Mass.

JONES Speedometer Co., Bush Terminal, Brooklyn, N. Y.

RELIABLE Speedometer Co., 134 Eliot St., Boston, Mass.

SEARS - CROSS Co., Bush Terminal, Brooklyn, N. Y.
(See page 465.)

STANDARD Thermometer Co., 65 Shirley St., Boston, Mass.
(See page 639.)

STEWART-WARNER Speedometer Corp., Chicago, Ill.
(See page 461.)

TROY Carriage Sun Shade Co., Troy, O.

STOVER-LANG Co., 219-23 Columbus Ave., Boston, Mass.

VAN SICKLEN Co., 14 Chicago St., Elgin, Ill.
(See page 459.)

VEEDER Mfg. Co., 22 Sargeant St., Hartford, Conn.

WALTHAM Watch Co., Waltham, Mass.
(See page 161.)

SOLUTION

PRIMING SOLUTION

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Polar."

POLAR—See Milwaukee Auto Specialty Co.

QUIXSTART Chemical Co., Providence, R. I.

SPADES

COLLAPSIBLE SPADES AND SHOVELS

BARNARD Specialty Co., 3300 Maple Ave., Los Angeles, Cal.

DUDLY Tool Co., Menominee, Mich.

WAYNESBURG Pressed Steel Co., Waynesburg, Pa.

WOOD Shovel & Tool Co., Piqua, O.

WYOMING Shovel Works, Wyoming, Pa.

SPOKES

WIRE SPOKES

NATIONAL Screw & Tack Co., Cleveland, O.
(See page 119.)

STANDARD Co., Torrington, Conn.

WIRE Goods Co., 28 Union St., Worcester, Mass.

SPONGES

SPONGES AND CHAMOIS

BLOCH & Sons, A., 101 Barclay St., New York, N. Y.

CARBONDALE Sponge Co., 220 Broadway, New York, N. Y. (Importers.)

DAVIS & Sons, D., 45 Warren St., New York, N. Y. (Importers.) "Vel Volla."

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Wood's Back Rest For Fords

Every Ford Passenger Car Indicates a Live Prospect for the Comfort of Wood's Back Rest

Has Universal Demand

The backs of Ford car seats are notorious for their discomfort. Dealers have plain sailing, with big easy sales, when they handle WOOD'S Back Rest for Ford cars. Add 100% to comfort of cars. Attached in 5 minutes by removing two nuts from top brackets. Every Ford owner is alive for a sale. Retail $5. Dealer's price $3.

NEVER LEAK · NEVER CREEP · TRADE MARK · EVERLOC · PATCH · PATENT PENDING · OFFICE, MINNEAPOLIS · FACTORY

The Only Cold Patch Trade Mark that Represents Three Years of Success—National Good Will—and Nearly 300,000 Sticking Patch Testimonials of Service

Your Customers Will Say "EVERLOC" The Patch That's Tried and True

The pioneer cold patch. Economical, easy to put on. Nationally advertised, used and sold. More than 300,000 in use. On the market more than 2 years —used on commercial and pleasure cars —and one has never come off. Your customers know EVERLOC. When they buy a patch they usually say "EVERLOC," and refuse substitutes.

Liberal Discounts

EVERLOC is the most economical patch, but discounts pay dealers well. Retail prices for 3 sized packages, 50c, $1, $1.50. Your prices, 35c, 60c, 90c. Special discounts on dozen lots or more. It will pay you if customers ask for "a patch" to give them EVERLOC.

W. C. Wood Company

40 N. 10th Street Minneapolis, Minn.

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SPONGES (Continued)

SPONGES AND CHAMOIS (Continued)

FLORIDA Sponge & Chamois Co., 73 Gold St., New York, N. Y. (Importers.)

FUCHS Co., Max, 244 Pearl St., New York, N. Y.

GREEK-AMERICAN Sponge Co., Franklin & Randolph Sts., Chicago, Ill. (Importers.)

LEVY Bros., 1241 Washington St., Boston, Mass. (Importers.)

LOUDEN & Hill, 624 Arch St., Philadelphia, Pa.

MERMAID—See Moses Sons & Co.

MOSES Sons & Co., A., 73 Wooster St., New York, N. Y. "Mermaid."

NASSAU Sponge Co., 232 W. Lake St., Chicago, Ill.

NATIONAL Sponge & Chamois Co., 158 William St., New York, N. Y. (Importers.)

NIEHAUS Co., Jos., 341 Fourth Ave., W., Cincinnati, O. (Importers.)

PERFOLAM Sponge Co., 1304 E. 20th St., Cleveland, O.

RHODES & Co., J. H., 162 W. Kinzie St., Chicago, Ill. (Importers.)

SMITH, Kline & French Co., 429 Arch St., Philadelphia, Pa.

VEL VOLLA—See Davis & Sons.

WESTERN Robe Mills, 43-45 Peck Ct., Chicago, Ill. (Importers.)

SPRAGS

DROP SPRAGS

(See Brakes, Drop)

SPRINGS

LEAF SPRINGS

ALLOY Steel Spring Co., Jackson, Mich.

AMERICAN Spiral Spring & Mfg. Co., 56th & Butler Sts., Pittsburg, Pa.

ANSTED Spring & Axle Co., Connersville, Ind.

ARMSTRONG Mfg. Co., J. B., Flint, Mich.

B. E. F. Auto Spring Co., 2148 Scranton Rd., Cleveland, O.

BALIFF—See Hess-Pontiac Spring & Axle Co.

BETTS Spring Co., 888 Folsom St., San Francisco, Cal.

BUCKEYE Spring Works, 1919 Race St., Cincinnati, O.

BUFFALO Automobile Spring Co., 146 Virginia St., Buffalo, N. Y.

CAMBRIA Spring Co., 913-21 Santee St., Los Angeles, Cal.

CHAMPION Auto Spring Co., 3120 Locust St., St. Louis, Mo.
(See page 831.)

CLEVELAND-CANTON Spring Co., Canton, O.

COOPER Spring Co., Main Ave. & Center St., Cleveland, O.

DELANY & Son, D., Liberty & Hamilton Sts., Newark, N. J.

DETROIT Steel Products Co., Detroit, Mich.
(See page 785.)

GARDEN City Spring Works, 2300 Archer Ave., Chicago, Ill.

HARVEY Spring Co., Racine, Wis.
(See page 477.)

HESS-PONTIAC Spring & Axle Co., Pontiac, Mich. "Baliff."

HESS Spring & Axle Co., 124 W. 66th St., Cincinnati, O.

HIGGINS Spring & Axle Co., Racine, Wis.
(See page 847.)

IRON City Spring Co., 2916-26 Smallman St., Pittsburg, Pa.

JENKINS Vulcan Spring Co., 1402 Chestnut St., St. Louis, Mo. "Vulcan."
(See page 681.)

KALAMAZOO Spring & Axle Co., Portage St., Kalamazoo, Mich.

KRUPP—See Prosser & Son.

LAHER Auto Spring Co., 34 N. 15th St., Portland, Ore.

LIGGETT Spring & Axle Co., Monongahela, Pa.

MATHER Spring Co., Toledo, O.
(See page 475.)

MERRILL Spring Co., E. R., 526-32 West 28th St., New York, N. Y.

NATIONAL Spring Co., New Castle, Ind.

PALMER, Jos., 833 Rutherford Ave., Boston, Mass.

PENN Spring Works, Baldwinsville, N. Y.
(See page 658.)

PERFECTION Spring Co., Central Ave. & 65th St., Cleveland, O.
(See page 803.)

PITTSBURGH Spring Co., 5915 Center Ave., Pittsburg, Pa.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

PULLAU Steel Spring Co., Mt. Clemens, Mich.

ROWLAND, William & Harvey (Frankford), Philadelphia, Pa.
(See page 749.)

SHELDON Axle & Spring Co., Wilkes-Barre, Pa.
(See pages 33 to 40.)

SPRING Perch Co., Bridgeport, Conn.
(See page 475.)

STANDARD Steel Spring Co., Coraopolis, Pa.

STERLING Spring Co., 2148-62 Scranton Rd., Cleveland, O.

TITANIC—See Tuthill Spring Co.

TRIPLE Action Spring Co., 49 E. 28th St., Chicago, Ill.
(See page 855.)

TUTHILL Spring Co., 758 Polk St., Chicago, Ill. "Titanic."
(See page 473.)

VULCAN—See Jenkins Vulcan Spring Co.

WATERTOWN Spring Works, Watertown, N. Y.

WESTERN Spring & Axle Co., (Carthage), Cincinnati, O.
(See page 304.)

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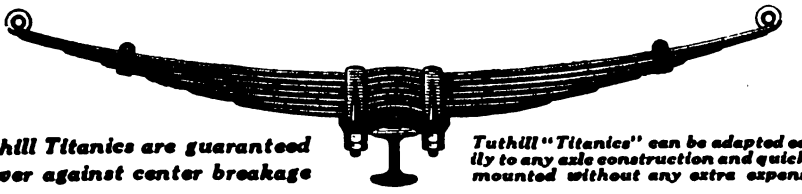
Tuthill Service Means Prompt deliveries on

Tuthill Titanic Springs

No center hole. No center nib. No center breakage.

All stock orders shipped the day received; all special orders shipped from factory within 48 hours or less.



Tuthill Titanics are guaranteed forever against center breakage

Tuthill "Titanics" can be adapted easily to any axle construction and quickly mounted without any extra expense.

Dealers: Write to your nearest Tuthill Distributor — or send to us direct for 1916 Price List, the most complete list ever published for spring replacements.

List of Distributors:

Albany.....Albany Hardware & Iron Co.
Atlanta.....Elyea-Austell Co.
Baltimore..Baltimore Hub Wheel & Mfg. Co.
Billings.....Barry Motor Co.
Boston.....Post & Lester Co.
Buffalo.....H. D. Taylor Co.
Chicago.....All Jobbers
Cincinnati.....The Ohio Rubber Co.
Cleveland.....Cray Bros.
Columbus.....Griswold-Sohl Co.
Dallas.....The Fisk Co. of Texas
Davenport.....Sieg Iron Company
Dayton.....S. T. & G. A. Gebhart
Denver.....Auto Equipment Co.
Des Moines.....Herring Motor Co.
Duluth.....Kelley-How-Thomson Co.
El Paso.....Western Motor Supply Co.
Evansville.....Orr Iron Co.
Fargo.....J. D. Grant
Florence, S. C......D. W. Alderman, Jr.
Fresno, Cal.....Chanslor & Lyon Co.
Grand Rapids.....Sherwood-Hall Co., Ltd.
Indianapolis.....W. J. Holliday Co.
Kansas City.....Faeth Iron Co.
Kansas City..Motor & Machinists Supply Co.
Lincoln.....Nebraska-Buick Auto Co.
Los Angeles.....Chanslor & Lyon Co.
Louisville.....Andrew Cowan & Co.
Milwaukee.....Babcock Auto Spring Co.
Minneapolis.....Western Motor Supply Co.
Nashville.....Auto Supply Co.
New Orleans.....Interstate Electric Co.
New York.....W. E. Pruden Hardware Co.
Oakland.....Chanslor & Lyon Co.
Peoria,
The National Electric & Auto Supply Co.
Philadelphia.....Manufacturers Supplies Co.
Pittsburg.....Pittsburg Auto Spring Co.
Portland.....Chanslor & Lyon Co.
Rochester.....Sidney B. Roby Co.
St. Louis.....Auto Devices Co.
Salt Lake City.....The Salt Lake Hdw. Co.
San Antonio.....The Fisk Co. of Texas
San Francisco.....Chanslor & Lyon Co.
Seattle.....Chanslor & Lyon Co.
Sioux City.....Sioux City Iron Co.
Sioux Falls.....The H. F. Brownell Co.
Spokane.....Chanslor & Lyon Co.
Tacoma.....Chanslor & Lyon Co.
Tampa.....The American Supply Co.
Toledo.....Union Supply Co.
Wichita.....Shattuck-George Iron Co.

Foreign Distributors:
Automobile Sundries Co..18 Broadway, N. Y.

Biggest Seller

The Tuthill Titanic yields a longer profit to dealers and garage men because more Tuthill Springs are sold for replacement than all other makes combined.

Our service is made possible because we have built our sales organization and our manufacturing facilities expressly for the purpose. We have distributors located at centers within one to twenty-four hours from any point, who can make immediate shipments.

Tuthill Titanics *cannot* break at the center—other springs made with a center hole or center nib, can and will break at the center.

Write today for our 1916 price list—the most complete list ever published for spring replacements.

Tuthill Spring Co.

758 Polk St.
CHICAGO, U. S. A.

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SPRINGS (Continued)

MACHINERY SPRINGS

AMERICAN Spiral Spring & Mfg. Co., 56th & Butler Sts., Pittsburg, Pa.

AMERICAN Steel & Wire Co., Chicago, Ill.
(See page 575.)

BARNES Co., Wallace, Wallace & Parallel Sts., Bristol, Conn.

CARY Spring Works, 240 W. 29th St., New York, N. Y.

CHATILLON & Sons, John, 85-93 Cliff St., New York, N. Y.

CLEVELAND Wire Spring Co., Cleveland, O.

COOK Spring Co., 420 E. 106th St., New York, N. Y.

CUYAHOGA Spring Co., 16600 Waterloo Rd., Cleveland, O.

DUNBAR Bros. Co., Bristol, Conn.

EAGLE—See Miller & Van Winkle.

EUREKA Spring Co., 347 W. Broadway, New York, N. Y.

FISCHER Spring Co., Chas., 88-90 Walker St., New York, N. Y.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GARDNER Wire Co., 5642 Race Ave., Chicago, Ill.

GENERAL Spring & Wire Co., Charlevoix & Beaufait Sts., Detroit, Mich.

GIBSON Co., Wm. D., Huron & Kingsbury Sts., Chicago, Ill.
(See page 703.)

HEBB, George A., 70 William St., Newark, N. J.

HUBBARD Spring Mfg. Co., Pontiac, Mich.
(See page 679.)

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors)
(See pages 547, 727 and 819.)

MILLER Wire Spring Co., Bridgeport, Conn.

MILLER & Van Winkle, 18 Bridge St., Brooklyn, N. Y. "Eagle."

MITCHELL Spring Works, W. G., Johnstown, Pa.

MORGAN Spring Co., Worcester, Mass.

MOTOR Car Spring Co., 245 W. 17th St., New York, N. Y.
(See page 809.)

N. Y. Wire & Spring Co., 586-88 Washington St., New York, N. Y.
(See page 789.)

PECK & YOUNG Mfg. Co., Forestville, Conn.

RAILWAY Steel-Spring Co., 30 Church St., New York, N. Y.

RAYMOND Mfg. Co., W. Church St., Corry, Pa.

SABIN Machine Co., Montpelier, Vt.

TUCK Mfg. Co., 74 Ames St., Brockton, Mass.

UNITED Spring Co., 241 Centre St., New York, N. Y.

WEBB Mfg. Co., ft. Center St., Newark, N. J.
(See page 739.)

WILSON, Robert P., 20 Clinton St., Newark, N. J.

SEAT OR UPHOLSTERY SPRINGS

AMERICAN Steel & Wire Co., Chicago, Ill.
(See page 575.)

BARBER Mfg. Co., Anderson, Ind.
(See page 477.)

BLACK VELVET—See National Spring & Wire Co.

CHAMPION—See Wing Co.

D'ARCY Spring Co., Kalamazoo, Mich.
(See page 763.)

DEAN Wire Goods Co., 180 Austin Ave., Worcester, Mass.

DETROIT Wire Spring Co., Westminster & Russell Sts., Detroit, Mich.
(See page 691.)

EXCELSIOR—See Trenton Spring & Mattress Co.

FOSTER Bros. Mfg. Co., 811 Broad St., Utica, N. Y.

GIBSON Co., Wm. D., Huron & Kingsbury Sts., Chicago, Ill.
(See page 703.)

JACKSON Cushion Spring Co., Jackson, Mich. "Rough Rider."
(See page 853.)

KELLEY & Co., E., 4 Cherry St., Worcester, Mass.

LACE WEB—See Trenton Spring & Mattress Co.

MILLER Wire Spring Co., Bridgeport, Conn.

MILLER & Van Winkle, 18 Bridge St., Brooklyn, N. Y.

MORGAN Spring Co., Worcester, Mass.

MURRAY Spring Co., Wm. A., 132 Sycamore St., Cincinnati, O.

NATIONAL Spring & Wire Co., Albion, Mich. "Black Velvet," "Rocky Road."

PERFECTION Coil Spring Co., 283 E. Main St., Jackson, Mich.

ROCKY ROAD—See National Spring & Wire Co.

ROUGH RIDER—See Jackson Cushion Spring Co.

SIMMONS Mfg. Co., Kenosha, Wis.

STAPLES & Hanford Co., Newburgh, N. Y.

TRENTON Spring Mattress Co., Trenton, N. J. "Excelsior," "Lace Web."

VINCENT-ALWARD Co., Kenosha, Wis

WING Co., Charles, Amesbury, Mass "Champion."
(See page 857.)

SUPPLEMENTARY SPRINGS

(See also Shock Absorbers; also Straps, Rebound)

ALISCO—See Allen Iron & Steel Co.

ALLEN Iron & Steel Co., 1790 Broadway, New York, N. Y. "Alisco."
(See page 641.)

ALTA—See Temco Electric Motor Co.

AUTO Accessory Mfty., 84 Depot St., Canisteo, N. Y. "Eureka."

AUTO Devices Co., 3214 Locust St., St Louis, Mo. "Pamco."
(See page 715.)

AUTO Device Mfg. Co., Manufacturers' Home Bldg., Milwaukee, Wis.

AXWELL Equipment Co., Ferguson Bldg Pittsburg, Pa.

B. B. Mfg. Co., 3200 S. Park Ave., Chicago, Ill. "Palace."

BLACKLEDGE Mfg. Co., John W., 341 E. Ohio St., Chicago, Ill. "Velvet."

BUCKEYE—See Central Brass & Fixture Co.

C-C—See Cox Brass Mfg. Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

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MATHER SPRING Co.

Mather Springs
ARE
Scientifically Heat-Treated

That means:— GREATER ELASTICITY—
GREATER STRENGTH—
GREATER ENDURANCE—
GREATER UNIFORMITY—
GREATER LIFE—
SATISFACTION!

Genuine made only by

THE MATHER SPRING COMPANY
TOLEDO, OHIO

SPRINGS

of SUPERIOR MANUFACTURE

For PLEASURE and COMMERCIAL VEHICLES

The
Spring Perch Co.

BRIDGEPORT, CONN.

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SPRINGS (Continued)

SUPPLEMENTARY SPRINGS (Continued)

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Coxajusto," "C-C."
(See page 717.)

COXAJUSTO—See Cox Brass Mfg. Co.

EUREKA—See Auto Accessory Mfty.

FALKENHAINER & Co., 313 Carr St., St. Louis, Mo. "Ri-D-Z."

FOX Pneumatic Shock Absorber Co., Broad & Race Sts., Philadelphia, Pa.

HALLADAY Co., L. P., Streator, Ill.

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

HEADLIGHT Support Co., 728 Woodward Ave., Detroit, Mich.

J. M. Shock Absorber Co., 210 S. 17th St., Philadelphia, Pa.

JENNEY Mfg. Co., 535 N. Capitol Ave., Indianapolis, Ind.

JOHNSON—See Triple Action Spring Co.

K. T. Lever Spring Co., 332 W. 70th St., New York, N. Y.

KEYSTONE Sales Co., 516 Federal St., Pittsburgh, Pa.

KEYSTONE Shock Absorber Co., Federal & Penn Aves., Pittsburg, Pa.

KIM Mfg. Co., Merrimac, Mass.

KING-FLEX—See Vehicle Specialty Co.

PALACE—See B. B. Mfg. Co.

KOKOMO Spring Co., Kokomo, Ind.

NOXAL Co., 29 S. Clinton St, Chicago, Ill.

PAMCO—See Auto Devices Co.

POLLEYS Pneumatic Cylinder Co., 375 Central Ave., Newark, N. J.

RI-D-Z—See Falkenhainer & Co.

RIGHT Motor Specialties Co., 1322 Michigan Ave., Chicago, Ill.

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y.

ST. LOUIS Supplementary Spiral Spring Co., 4523 Delmar Ave., St. Louis, Mo.

STONE—See Universal Rim Co.

TEMCO Electric Motor Co., Leipsic, O. "Alta."
(See pages 448 and 449.)

TRIPLE Action Spring Co., 49 E. 28th St., Chicago, Ill. "Johnson."
(See page 855.)

TWIN Spring Co., 998 Boylston St., Boston, Mass.

UNIVERSAL Rim Co., 1502 Michigan Ave., Chicago, Ill. "Stone."
(See page 633.)

UNIVERSAL Shock Eliminator, 6-8 W. 62d St., New York, N. Y.

UTILITY Shock Absorber Co., 1426 Vine St., Philadelphia, Pa.
(See page 761.)

VEHICLE Specialty Co., 26 State St., Hartford, Conn. "King-Flex."

VELVET—See Blackledge Mfg. Co.

TOP STRAP SPRINGS

BON Mfg. Co., Elgin, Ill. "Elgin."

ELGIN—See Bon Mfg. Co.

TOW ROPE SPRINGS

ZIMMERMAN'S Garage, Valparaiso, Ind.

SPROCKETS

MACHINED SPROCKETS

(For Sprocket Blanks—See Castings; also Forgings; also Gears, Blank)

BALDWIN Chain & Mfg. Co., Worcester, Mass.
(See page 663.)

BILLINGS & Spencer Co., Hartford, Conn.

BOSTON Gear Works, (Norfolk Downs), Quincy, Mass.
(See page 249.)

CROFOOT Gear Works, 31 Ames St., Cambridge, Mass.

CROWN—See Great Western Mfg. Co.

CULLMAN Wheel Co., 1856 Altgeld St., Chicago, Ill.
(See page 669.)

DIAMOND Chain & Mfg. Co., 231 W. Georgia St., Indianapolis, Ind.

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

FORG, Peter, 50 Park St., Somerville, Mass.

GREAT Western Mfg. Co., Laporte, Ind. "Crown."

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass.
(See page 249.)

PENNSYLVANIA Gear & Machine Co., 435 N. Broad St., Philadelphia, Pa.

RUSSEL Wheel & Foundry Co., Chene St. & Belt Line R. R., Detroit, Mich.

SIER-BATH Co., 143 W. 54th St., New York, N. Y.
(See page 825.)

STAMPINGS

STEEL STAMPINGS

A. B. & B. Specialty Co., 764 Windlake Ave., Milwaukee, Wis.

ACKLIN Stamping Co., 1645 Dorr St., Toledo, O.

ADELL Mfg. Co., Orange, Mass.

ADVANCE Machinery Co., Toledo, O.
(See page 609.)

AKRON-SELLE Co., High & Chestnut Sts., Akron, O.

ALUMINUM Co. of America, Pittsburg, Pa.
(See page 479.)

AMERICAN Brass Novelty Co., Grand Haven, Mich.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

ASHLEY Machine Works, 724 University Ave., Rochester, N. Y.
(See page 323.)

BAY STATE Stamping Co., 380 Chandler St., Worcester, Mass.

BETCO—See Blodgett Engineering & Tool Co.

BETTCHER Mfg. Co., Cleveland, O.

BLAIR Tool & Machine Works, 521 Greenwich St., New York, N. Y.

BLODGETT Engineering & Tool Co., Fort & Beaubien Sts., Detroit, Mich. "Betco."

BOSSERT Co., Utica, N. Y.
(See page 279.)

Complete Index to Classification appears on Pages 8 to 27.

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Atlanta .....Alexander-Seewald Co.
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Austin, Tex.....W. T. Wroe & Sons
Baltimore.....Henry Keidel & Co.
Billings, Mont...Northwestern Auto Sup. Co.
Birmingham, Ala....Drennen Motor Car Co.
Bluefield, W. V.....W. H. Harry & Co.
Charleston, S. C.....Cameron & Barkley Co.
Chattanooga.....Southern Auto Sup. Co.
Chicago.....Maremont Mfg. Co.
Cincinnati.....Wheel, Top & Hdw. Co.
Clinton, Okla.....Welch Wholesale Hdw. Co.
Dallas.....Ferris-Dunlap Auto Sup. Co.
Danville, Va.....Piedmont Hdw. Co.
Denver.....M. L. Foss
Duluth.....Kelley Hdw. Co.
Evansville, Ind.....Orr Iron Co.
Ft. Smith, Ark.....Meister Bros. & Bracht
Ft. Wayne, Ind.....Mossman, Yarnelle & Co.
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Macon, Ga.....S. S. Parmelee Co.
Memphis.....Ozburn Auto Supply Co.
Milwaukee.....Shadbolt & Boyd Iron Co.
Minneapolis.....Williams Hdw. Co.
Monroe, La.....Monroe Hdw. Co.
Norfolk.....W. H. Grover
Oklahoma City.....Severin Tire & Sup. Co.
Paris, Tex.....W. F. Dulaney & Sons
Peoria.....Cummings & Emerson
Portland, Ore.....J. E. Haseltine & Co.
Richmond, Va.....Talman Auto Sup. Co.
Richmond, Ind.....Jones Hardware Co.
Roanoke .....Meadows-Price Co.
Salt Lake City..The Inter-Mountain Elec. Co.
San Francisco.....Waterhouse & Lester Co.
Seattle.....Polson Implement Co.
Shreveport .....Henderson's Garage
Sioux Falls.....The L. & L. Motor Sup. Co.
Tacoma, Wash.....The Automobile Sup. Co.
Tampa.....C. W. Greene Co.
Toledo.....The Roberts-Toledo Auto Co.
Washington, N. C.....Harris Hdw. Co.

THE HARVEY SPRING CO., Racine, Wis.

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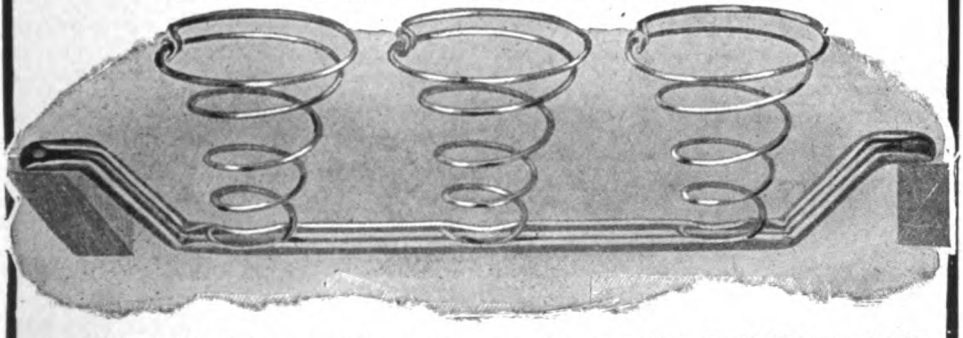

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STAMPINGS (Continued)

STEEL STAMPINGS (Continued)

BOSTON Pressed Metal Co., 175 Union St., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.
(See page 117.)

BRISCOE Mfg. Co., Woodward & Baltimore Aves, Detroit, Mich.

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

BURNS & Bassick Co., Bridgeport, Conn.
(See page 211.)

BURR Mfg. Co., 1100 Power Ave., Cleveland, O.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CASSADY-FAIRBANK Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

CHICAGO-RACINE Aluminum, Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.

CITY Iron Works & Machine Co., 520 S. Delaware Ave., Philadelphia, Pa.
(See page 795.)

CLAYTON & Lambert Mfg. Co., 201 Piquette Ave., E., Detroit, Mich.

CLEVELAND Wrought Washer Co., 3590 W. 58th Ct., Cleveland, O.

COLUMBUS Auto Parts Co., 215-31 E. Russell St., Columbus, O.
(See page 763.)

CROSBY Co., Buffalo, N. Y.
(See page 699.)

CROWE Name Plate & Engraving Co., Chicago, Ill.
(See page 699.)

CUSTER Pressed Steel Wheel Co., Bradford, Pa.

DETROIT Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

DETROIT Pressed Steel Co., 1800 Mt. Elliott Ave., Detroit, Mich.
(See page 281.)

DETROIT Stamping Co., 55-57 W. Fort St., Detroit, Mich.

DIAMOND Mfg. Co., Detroit, Mich.

DIAMOND Stamping Works Co., 5400 Windsor Ave., Cleveland, O.

DISSTON & Sons, Henry, (Tacony), Philadelphia, Pa.

DRIGGS-SEABURY Ordnance Co., Sharon, Pa.
(See page 363.)

DUNKIRK Corp., Dunkirk, N. Y.

EASTERN Machine & Stamping Co., 15 Wickenden St., Providence, R. I.

ENGLAND Mfg. Co., 1559 Jefferson Ave., W., Detroit, Mich.

ENTERPRISE Mfg. Co., Akron, O.

ERIE Stamping & Mfg. Co., 644-48 W. 12th St., Erie, Pa.

EVERETT Mfg. Co., 162-64 N. May St., Chicago, Ill.

FANNER Mfg. Co., Brookside Pk., Cleveland, O.

FEDERAL Pressed Steel Co., Milwaukee, Wis.
(See page 783.)

FORG, Peter, 50 Park St., Somerville, Mass.

FORSYTH Bros. Co., Harvey, Ill.
(See page 241.)

FORT DEARBORN Mfg. Co., Sterling, Ill.

GASKET Supply Co., 1729 Ludlow St., Philadelphia, Pa.
(See pages 765 and 795.)

GEM Mfg. Co., Goebel & Fulton Sts., Pittsburg, Pa.

GEM Stamped Steel Co., Chelsea, Mass.
(See page 479.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis.
(See page 479.)

GIER Pressed Steel Co., Lansing, Mich.
(See page 787.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

GREAT Western Mfg. Co., Laporte, Ind.

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

HARDY Mfg. Co., Pendleton, Ind.
(See page 223.)

HASTINGS Mfg. Co., Hastings, Mich.
(See page 452.)

HAWTHORNE Mfg. Co., 38 Spruce St., Bridgeport, Conn.
(See page 307.)

HAYES-IONIA Co., Ionia, Mich.

HERO Mfg. Co., Gaul & Adams Sts., Philadelphia, Pa.

HILL Co., Geo. Q., 32-34 Dorchester Ave., Boston, Mass.

HOEFT & Co., Ashland Ave. & Kinzie St., Chicago, Ill.

HUBBARD Spring Mfg. Co., Pontiac, Mich.
(See page 679.)

HUNT & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.

HYDRAULIC Pressed Steel Co., 3180 E. 61st St., Cleveland, O.
(See pages 229 and 230.)

INDIANAPOLIS Tool & Mfg. Co., 520 S. Capitol Ave., Indianapolis, Ind.

INDUSTRIAL Electric Mfg. Co., 139 Beaubien St., Detroit, Mich.

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

JANNEY, Steinmetz & Co., Philadelphia, Pa.
(See page 515.)

KALES-HASKEL Co., 441-53 Lafayette Blvd., Detroit, Mich.

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

KEYLESS Lock Co., 1401 Newman St., Indianapolis, Ind.

KICKHAEFER Mfg. Co., 199-201 Oregon St., Milwaukee, Wis.

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

LINDHOLM Metal Stamping Co., 107-15 Erie St., Camden, N. J.
(See page 851.)

McCORD Mfg. Co., Detroit, Mich.
(See page 418 and 419.)

McDOWELL Mfg. Co., 541 Wood St., Pittsburg, Pa.

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STAMPINGS (Continued)

STEEL STAMPINGS (Continued)

MANN Corp., Kankakee, Ill.

MATHEWS Mfg. Co., H. A., Seymour, Conn

MATTHEWS Mfg. Co., 104 Gold St., Worcester, Mass.

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

METAL Specialty Co., Cincinnati, O.

METALLIC Products Co., 200 Fifth Ave., New York, N .Y. (Distributors.)
(See pages 547, 727 and 819.)

METROPOLITAN Mfg. Co., Detroit, Mich.
(See page 479.)

MICHIGAN Metal Spinning Mfg. Co., Woodbridge St., Detroit, Mich.

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

MOLINE Pressed Steel Co., East Moline, Ill.

MORGAN Spring Co., Worcester, Mass.

MOSSBERG Co., Frank, Attleboro, Mass.
(See page 773.)

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (Distributors.)
(See page 867.)

MURRAY Mfg. Co., J. W., 550 Clay Ave., Detroit, Mich.

NATIONAL Stamping & Electric Works, 410-26 Clinton St., Chicago, Ill.

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn.
(See page 753.)

NEWARK Stamping & Foundry Co., Newark, O.

OAKES Pressed Steel Co., Indianapolis, Ind.

OSBORNE & Stephenson Mfg. Co., Plainville, Conn.
(See page 709.)

PARISH Mfg. Co., Reading, Pa.
(See page 709.)

PARISH & Bingham Co., Cleveland, O.
(See page 235.)

PARKER White Metal & Machine Co., Railroad St., Erie, Pa.
(See page 149.)

PFAHL Gauge & Mfg. Co., Akron, O.

PFAU Mfg. Co., Mentor & Huston Aves., Cincinnati, O.

PRESTEEL Co., 214 E. 34th St., Lorain, O.

QUINSIGAMOND Pressed Steel Co., 62 Jackson St., Worcester, Mass.

R-B-L Co., 265 Jefferson St., E., Detroit, Mich.

R. P. K. Pressed Metal Co., Bridgeport, Conn.

RAMSDELL Specialty Co., W. Boylston St., Worcester, Mass.

RELIANCE Engineering Co., Lansing, Mich.

ROCHESTER Pressed Steel Co., 85-87 Ford St., Rochester, N. Y.

ROYAL Enameling & Mfg. Co., 326 W. Madison St., Chicago, Ill.

S. A. Machine Co., Detroit, Mich.
(See page 749.)

S. & I. Co., 53-55 Governor St., Springfield, Mass.

SCHATZ Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.

SCOVILL Mfg. Co., 222 W. Lake St., Chicago, Ill.
(See page 255.)

SESSIONS & Son, J. H., Bristol, Conn.

SMITH Co., A. O., Milwaukee, Wis.
(See page 481.)

SMITH Co., Thomas, 13 Cypress St., Worcester, Mass.

SPAFFORD Tool Works, 32 Union Pl., Hartford, Conn.

SPECIAL Machine Co., 184 John St., Bridgeport, Conn.

STAMPING & Tool Co., Third & Cass Sts., La Crosse, Wis.

STANDARD Mfg. Co., 990 Housatonic Ave., Bridgeport, Conn.

STANDARD Steel Box Co., Bridgeville, Pa.

STANDARD Tool & Mfg. Co., 68-72 E. Lafayette Ave., Detroit, Mich.

STANLEY Works, New Britain, Conn.
(See page 269.)

STEARNS Stamping Co., W. H., 34 Southbridge St., Worcester, Mass.

STERLING Metal Parts Co., Eighth St., & Oklahoma Ave., Milwaukee, Wis.

SUPERIOR Metal Products Co., Bond & Adams Sts., Elyria, O.

SYRACUSE Stamping Co., 1056 S. Clinton St., Syracuse, N. Y.

TOLEDO Steel Barrel Co., Toledo, O.

TRANSUE & Williams Co., 580 W. Ely St., Alliance, O.
(See page 785.)

TUTTLE & Bailey Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.

UNIQUE Findings & Supply Co., Providence, R. I.
(See page 613.)

VARIETY Mfg. Co., 340-52 N. Sacramento Blvd., Chicago, Ill.

VOELKNER & Harry Mfg. Co., 282-92 Woodbridge St., E., Detroit, Mich.

VOGEL & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.

W. & S. Mfg. Co., 9 Hunt St., Worcester, Mass.

WAGNER Mfg. Co., E. R., North Milwaukee, Wis.
(See pages 300 and 301.)

WALKER-WELLS Co., Amesbury, Mass.

WILCOX Co., W. W., 1713-35 Armitage Ave., Chicago, Ill.

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

XARDELL Bros. Co., 28 Broadway, Utica, N. Y.

ZIEGLER Mfg. Co., Alexandria, Ind.

ZENITE Metal Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

STANDS

WASH STAND LIGHT STANDS

(See Lights, Wash Stand)

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ACETYLENE GAS ENGINE STARTERS

MONTROY Ignition Starter Co., Coahoma, Miss.

POLSON Mfg. Co., 27 Chenango St., Buffalo, N. Y.

COMPRESSED AIR ENGINE STARTERS

AUTO Air Appliance Co., 501 E. Preston St., Baltimore, Md.

CHRISTENSEN Engineering Co., 841-47 30th St., Milwaukee, Wis.

CRESCENT Co., 1199 Woodward Ave., Detroit, Mich.

G. & M.—See Goodwin & Miles Co.

GOODWIN & Miles Co., 241 Sansome St., San Francisco, Cal. "G. & M."

HAM-MEIX Mfg. Co., W. 11th St. & Belt Railroad, Indianapolis, Ind. "H & M."

H & M—See Ham-Meix Mfg. Co.

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

KILGORE Motor Starter Co., Barrister's Hall, Boston, Mass.

LIPMAN Air Appliance Co., 199 Pleasant St., Beloit, Wis.

NORTHERN Engineering Works, 2 Chene St., Detroit, Mich. "Thurber."

ROTH-MURPHY Engine Starter Co., Lemcke Bldg., Indianapolis, Ind.

SHIMPF Starter Co., 114 State St., Boston, Mass.

SMITH, IRVIN C., 855 S. Los Angeles St., Los Angeles, Cal.

STANDARD Appliance Co., Trust Co. Bldg., Franklin, Pa.

THURBER—See Northern Engineering Works.

ELECTRIC ENGINE STARTERS

ALLIS-CHALMERS Mfg. Co., Milwaukee, Wis.

APELCO—See Apple Electric Co.

APPLE Electric Co., Newark, N. J. "Apelco."

AUTO-LITE—See Electric Auto-Lite Co.

BIJUR Motor Lighting Co., 15th St. & River Front, Hoboken, N. J.

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

BRIGGS Magneto Co., Elkhart, Ind.

DAYTON Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."

DELCO—See Dayton Engineering Laboratories Co.

DETROIT Starter Co., Detroit, Mich. (See page 867.)

DISCO Electric Starter Corp., Detroit, Mich. (See page 651.)

DUNNING—See Schwier Mfg. Co.

DYNETO Electric Co., Syracuse, N. Y., "Ents." (See page 487.)

ECONOMY Electric Co., Ambridge, Pa.

ELECTRIC Auto-Lite Co., Toledo, O. "Auto-Lite." (See pages 215 to 218.)

ENTZ—See Dyneto Electric Co.

FEDERAL Devices Co., 1251 Michigan Ave., Chicago, Ill.

GRAY & Davis, Boston, Mass. (See pages 483 to 486.)

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J. (See page 457.)

HEINZE Co., John O., Springfield, O. (See page 487.)

HOLT Electric Co., 377 S. Pierce St., Milwaukee, Wis.

HUFF—See Simms Magneto Co.

JENNEY Electric Corp., Canal & Tenth Sts., Indianapolis, Ind.

JESCO—See Jones Electric Starter Co.

JONES Electric Starter Co., 1400 W. Adams St., Chicago, Ill. "Jesco."

KEMCO Electric Mfg. Co., 2229 Ashland Rd., Cleveland, O.

L-N—See Leece-Neville Co.

LAMB Co., F. J., 940 Jefferson Ave., Detroit, Mich.

LEECE-NEVILLE Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

LEONARD Electric Co., Ward, Mt. Vernon, N. Y.

MAXIMUM Electrical Co., 264-68 Jefferson Ave., E., Detroit, Mich.

NORTH East Electric Co., Rochester, N. Y. (See page 487.)

REMY Electric Co., Anderson, Ind. (See page 733.)

SAMSON Engineering Co., Louisville, Ky.

SCHWIER Mfg. Co., H. F., Boydell Bldg., Detroit, Mich. "Dunning."

SIMMS Magneto Co., East Orange, N. J. "Huff." (See page 627.)

U-S-L—See U S Light & Heat Corp.

U S Light & Heat Corp., Niagara Falls, N. Y. "U-S-L." (See page 295.)

WAGNER Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

GASOLINE OR VAPOR ENGINE STARTERS

(For Priming Devices—See Primers; Gasoline Engine

AUTOMATIC Starter Co., 418 N. Third St., St. Louis, Mo.

BROWN-MADDOCK Co., West Newbury, Mass.

MARKHAM Co., W. D., Clarksdale, Miss.

STOCKER Mfg. Co., 90 E. Woodbridge St., Detroit, Mich. "Surety."

SURETY—See Stocker Mfg. Co.

Complete Index to Classification appears on Pages 8 to 27.

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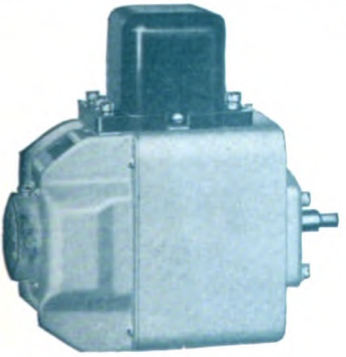
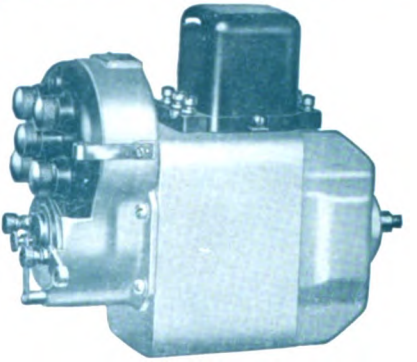
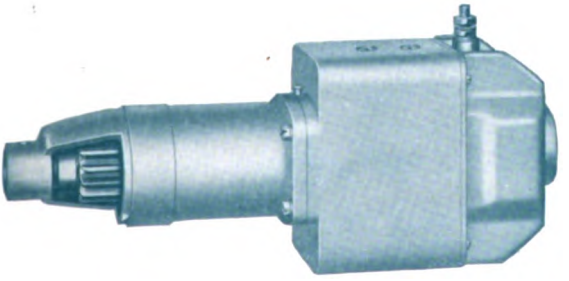
GRAY & DAVIS ELECTRICAL EQUIPMENT



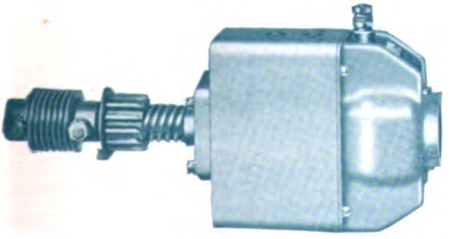
Dynamo, Type 220



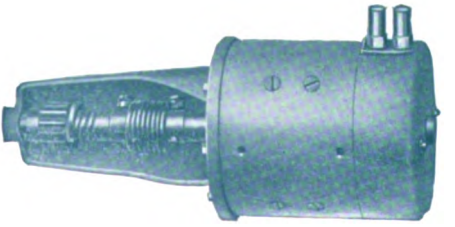
Ignition Dynamo, Type 224



Starting Motor, Type 121
Equipped with Outboard Automatic Pinion Shift



Starting Motor, Type 120
Equipped with Inboard Automatic Pinion Shift



Starting Motor, Type 122
Equipped with Outboard Automatic Pinion Shift

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Type B-2, B-3
Price, Per Pair, $28, $24

Electric Headlight
Type E-55, E-56
Price, Per Pair, $13, $15

Electric Headlight
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Type E-57, E-58
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Type B-3
Price, Each $15

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Pillar Lamp
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Pillar Lamp
Type E-6
Price, Per Pair, $15

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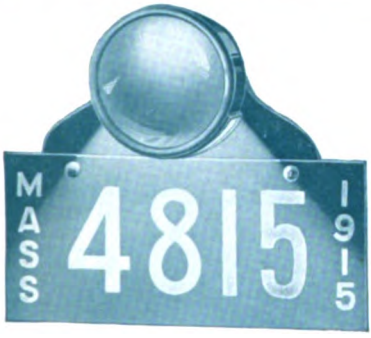
DAVIS EQUIPMENT



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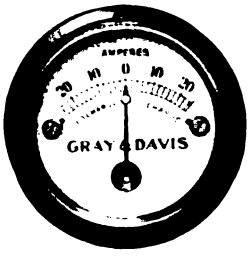

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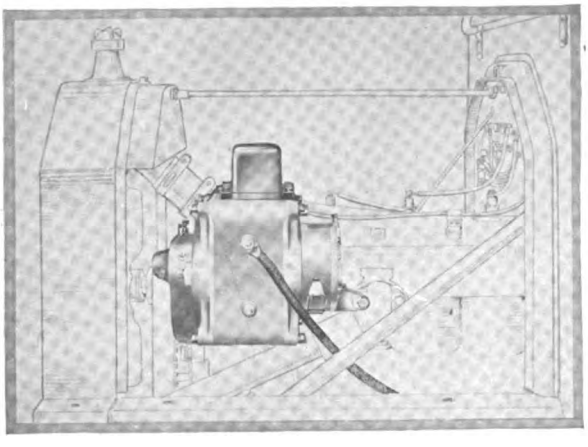

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Simplicity High quality

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Low installation cost.

Heinze-Springfield systems combine all the above advantages. They assure positive high speed tranking, trouble proof lighting and ignition, at moderate cost. Samples for testing furnished manufacturers on request.

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Springfield, Ohio (4)

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STARTING AND LIGHTING
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STARTERS (Continued)

MANUAL OR PEDAL OR LEVER ENGINE STARTERS

(See also Cranks, Safety Starting)

PRES-TOE—See Robertson Machine & Foundry Co.

ROBERTSON Machine & Foundry Co., W., Buffalo, N. Y. "Pres-Toe."

MECHANICAL OR SPRING ENGINE STARTERS

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

ELDER Mfg. Co., 2305 N. Illinois St., Indianapolis, Ind.

EVEREADY—See American Ever Ready Works.

FROST Mfg. Co., Galesburg, Ill. "Startzer."

ROCKWAY—See Rowell Co.

ROWELL Co., I. B., Waukesha, Wis. "Rockway."

STARTZER—See Frost Mfg. Co.

STEEL

DEALERS IN STEEL

(This is a List of Dealers in Iron, Steel and other metals who advertise in this publication)

BETZ-PIERCE Co., Cleveland, O. (See page 821.)

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (See page 491.)

HARVEY Co., Arthur C., 374 Congress St., Boston, Mass. (See page 847.)

MORRIS & Co., E. K., 311-17 W. Second St., Cincinnati, O. (See page 809.)

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (See page 867.)

ANGLE, CHANNEL AND TEE IRON OR STEEL

CAMBRIA Steel Co., Johnstown, Pa.

CARNEGIE Steel Co., Carnegie Bldg., Pittsburg, Pa.

ILLINOIS Steel Co., 208 S. La Salle St., Chicago, Ill.

INLAND Steel Co., First National Bank Bldg., Chicago, Ill.

JONES & Laughlin Steel Co., Pittsburg, Pa.

LOCKHART Iron & Steel Co., McKees Rocks, Pa. "Vulcan."

LOGAN Iron & Steel Co., 1421 Chestnut St., Philadelphia, Pa.

PENNSYLVANIA Steel Co., Morris Bldg., Philadelphia, Pa.

REPUBLIC Iron & Steel Co., Republic Bldg., Youngstown, O.

VULCAN—See Lockhart Iron & Steel Co.

BAR IRON OR STEEL

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

CAMBRIA Steel Co., Johnstown, Pa.

ILLINGSWORTH Steel Co., John (Frankford), Philadelphia, Pa.

ILLINOIS Steel Co., 208 S. La Salle St., Chicago, Ill.

INLAND Steel Co., First National Bank Bldg., Chicago, Ill.

JONES & Laughlin Steel Co., Pittsburg, Pa.

KRUPP—See Prosser & Son.

LACKAWANNA Steel Co., Buffalo, N. Y.

LOCKHART Iron & Steel Co., McKees Rocks, Pa. "Vulcan."

LOGAN Iron & Steel Co., 1421 Chestnut St., Philadelphia, Pa.

PARDEE Works, C., Perth Amboy, N. J.

PENNSYLVANIA Steel Co., Morris Bldg., Philadelphia, Pa.

PHILADELPHIA Steel & Forge Co., 50 Church St., New York, N. Y.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

RAILWAY Steel-Spring Co., 30 Church St., New York, N. Y.

REPUBLIC Iron & Steel Co., Republic Bldg., Youngstown, O.

UNITED Steel Co., Canton, O.

VULCAN—See Lockhart Iron & Steel Co.

SHEET STEEL

ALLEGHENY Steel Co., Brackenridge, Pa.

AMERICAN Rolling Mill Co., Middletown, O. "Middletown."

AMERICAN Sheet & Tin Plate Co., Frick Bldg., Pittsburg, Pa.

CARNAHAN Tin Plate & Sheet Co., Canton, O.

COLONIAL Steel Co., Keystone Bldg., Pittsburg, Pa.

FOLLANSBEE Bros. Co., Third & Liberty Aves., Pittsburg, Pa.

INLAND Steel Co., First National Bank Bldg., Chicago, Ill.

KRUPP—See Prosser & Son.

LA BELLE Iron Works, Steubenville, O.

McVOY Sheet & Tin Plate Co., 344-50 W. Michigan St., Chicago, Ill.

MASSILLON Rolling Mill Co., Massillon, O.

MIDDLETOWN—See American Rolling Mill Co.

PARKERSBURG Iron & Steel Co., Parkersburg, W. Va.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

TAYLOR Co., N. & G., 308 Chestnut St., Philadelphia, Pa.

YOUNGSTOWN Sheet & Tube Co., Youngstown, O.

COLD ROLLED BAR STEEL

CAMBRIA Steel Co., Johnstown, Pa.

COLUMBIA Steel & Shafting Co., Kirkwood St., Pittsburgh, Pa.

Complete Index to Classification appears on Pages 8 to 27.

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Makers of Bright Cold Finished Steel; Rounds, Flats, Squares, Hexagons, and Special Shapes, for shafting, machine construction, etc. Cold Drawn Bright Free Cutting Screw Steel, Brand AA1, for rapid machining in hand and automatic screw machines. Cone Steel, Axle Steel, Crucible and Open Hearth Nickel Steel, Chrome Vanadium Steel for automobile and bicycle parts, axles, etc.

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CLEVELAND, CHICAGO, SAN FRANCISCO

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STEEL (Continued)

COLD ROLLED BAR STEEL (Continued)

COMPRESSED Steel Shafting Co., 393 Dorchester Ave., Boston, Mass.

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburg, Pa.

CUMBERLAND Steel Co., Williams St. & B. & O. R. R., Cumberland, Md.

FITZSIMONS Co., 1623 Wilson Ave., Youngstown, O.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (Distributors.) (See page 491.)

JONES & Laughlin Steel Co., Pittsburg, Pa.

KRUPP—See Prosser & Son.

MOLTRUP Steel Products Co., Beaver Falls, Pa. (See page 705.)

NEW Process Steel Corp., Manheim Pike. Lancaster, Pa.

PARDEE Works, C., Perth Amboy, N. J.

PITTSBURG Shafting Co., of Detroit, Detroit, Mich.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

UNION Drawn Steel Co., Beaver Falls, Pa. (See page 489.)

UNITED Steel Co., Canton, O.

COLD ROLLED STRIP STEEL

AMERICAN Steel & Wire Co., Chicago, Ill. (See page 575.)

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

CARPENTER Steel Co., Reading, Pa.

COLUMBIA Steel Co., Elyria, O. (See page 489.)

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburg, Pa.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (Distributors.) (See page 491.)

KRUPP—See Prosser & Son.

MOLTRUP Steel Products Co., Beaver Falls, Pa. (See page 705.)

MORRIS & Bailey Steel Co., Pittsburg, Pa.

PITTSBURG Shafting Co. of Detroit, Detroit, Mich.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

STANLEY Works, New Britain, Conn. (See page 269.)

SUPERIOR Steel Co., Carnegie, Pa.

WEST Leechburg Steel Co., 305 Fifth Ave., Pittsburg, Pa.

TOOL STEEL

ALLEN & Co., Edgar, 718 W. Lake St., Chicago, Ill. (Importers.)

ANDREW & Co., J. H., 26 Cortlandt St., New York, N. Y. (Importers.) "Toledo."

ARROW—See Crowley Co.

ATLAS Crucible Steel Co., 66 Howard Ave., Dunkirk, N. Y. "Deward."

BECKER Steel Co. of America, 90 West St., New York, N. Y. (Importers.)

BISCHOFF—See Elliott, H. A.

BLACK DIAMOND—See Crucible Steel Co. of America.

BOHLERS—See Houghton & Richards.

BOURNE-FULLER Co., Hickox Bldg., Cleveland, O.

BRAEBURN Steel Co., Braeburn, Pa.

BROWN & Co., 10th St. & Duquesne Way, Pittsburg, Pa.

CARBON Steel Co., ft. 32d St., Pittsburg, Pa. "Weto," "Cromo."

CARPENTER Steel Co., Reading, Pa. "Comet," "K-W," "Stentor."

COLONIAL Steel Co., Keystone Bldg., Pittsburg, Pa. "Red Star."

COLUMBIA Tool Steel Co., Chicago Heights, Ill.

COMET—See Carpenter Steel Co.

CRESCENT—See Crucible Steel Co. of America.

CROMO—See Carbon Steel Co.

CROWLEY Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow." (See page 699.)

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburgh, Pa. "Black Diamond," "Crescent," "Sanderson."

CYCLOPS Steel Works, 265 E. Spring St., Titusville, Pa.

DANNEMORA—See Nash Co.

DANNEMORA—See Ward's Sons.

DEWARD—See Atlas Crucible Steel Co.

ELLIOTT, H. A., Majestic Bldg., Detroit, Mich. (Importer.) "Bischoff."

FIRTH-STERLING Steel Co., McKeesport, Pa.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (See page 491.)

HALCOMB Steel Co., Syracuse, N. Y.

HELLER Bros. Co., Newark, N. J.

HESS Steel Co., Bridgeton Ave. & C. R. R. of N. J., Bridgeton, N. J. "Phoenix."

HOBSON, Houghton & Co., 82 Beekman St., New York, N. Y. (Importers)

HOUGHTON & Richards, 145 Oliver St., Boston, Mass. "Bohlers."

ILLINGSWORTH Steel Co., John (Frankford), Philadelphia, Pa.

JESSOP & Sons, Wm., 91 John St., New York, N. Y. (Importers.) (See page 489.)

K-W—See Carpenter Steel Co.

KRUPP—See Prosser & Son.

LANCASTER—See New Process Steel Corp.

LINDENBERG Steel Co., 90 West St., New York, N. Y. (Importers.)

LUDLUM Steel Co., Watervliet, N. Y. "Pompton."

McINNES Steel Co., Corry, Pa.

MIDVALE Steel Co. (Nicetown), Philadelphia, Pa.

NASH Co., Geo. 217 Pearl St., New York, N. Y. (Importers.) "Dannemora," (See page 547.)

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Case Hardening

Tempering

Special Heat-Treating

IN OPERATION SEPTEMBER 1st

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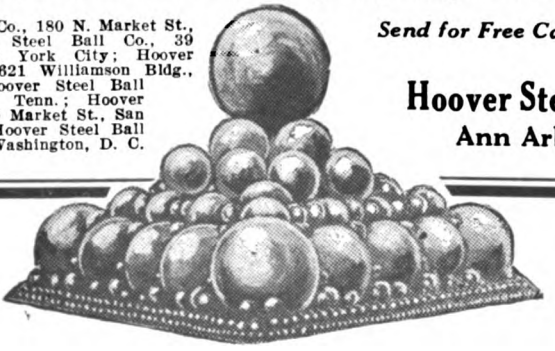
Ann Arbor, Mich.



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STEEL (Continued)

TOOL STEEL (Continued)

NEW Process Steel Corp., Manheim Pike, Lancaster, Pa. "Lancaster."

PHILADELPHIA Steel & Forge Co., 50 Church St., New York, N. Y.

PHOENIX—See Hess Steel Co.

PITTSBURGH Tool Steel Wire Co., Monaca, Pa.

POMPTON—See Ludlum Steel Co.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

RED STAR—See Colonial Steel Co.

ROECHLING Electro Steel Co., 173-77 Lafayette St., New York, N. Y. (Importers.)

SANDERSON—See Crucible Steel Co. of America.

SOLAR—See Nash Co.

STENTOR—See Carpenter Steel Co.

TOLEDO—See Andrew & Co.

UNIVERSAL Rolling Mill Co., Bridgeville, Pa.

VANADIUM-ALLOYS Steel Co., Latrobe, Pa. "Vasco."

VASCO—See Vanadium-Alloys Steel Co.

VULCAN Crucible Steel Co., First St., Aliquippa, Pa.

WARD'S Sons, Edgar T., 25 Purchase St., Boston, Mass. (Importers.) "Dannemora."
(See page 547.)

WETO—See Carbon Steel Co.

SPRING STEEL

ARROW—See Crowley Co.

BRAEBURN Steel Co., Braeburn, Pa.

CAMBRIA Steel Co., Johnstown, Pa.

CARNEGIE Steel Co., Carnegie Bldg., Pittsburg, Pa.

CARPENTER Steel Co., Reading, Pa. "Flexo."

CROWLEY Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."
(See page 699.)

CRUCIA—See United Steel Co.

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburgh, Pa.

FLEXO—See Carpenter Steel Co.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y.
(See page 491.)

HALCOMB Steel Co., Syracuse, N. Y.

HARROW Spring Co., First National Bank Bldg., Milwaukee, Wis.

HELMUTH Co., L., 17 Battery Pl., New York, N. Y. (Importers.)

ILLINOIS Steel Co., 203 S. La Salle St., Chicago, Ill.

KRUPP—See Prosser & Son.

MIDVALE Steel Co. (Nicetown), Philadelphia, Pa.

PENNSYLVANIA Steel Co., Morris Bldg., Philadelphia, Pa.

PHILADELPHIA Steel & Forge Co., 50 Church St., New York, N. Y.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

UNITED Steel Co., Canton, O. "Crucia."

UNIVERSAL Rolling Mill Co., Bridgeville, Pa.

VULCAN Crucible Steel Co., First St., Aliquippa, Pa.

MANGANESE STEEL

KRUPP—See Prosser & Son.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

UNITED Steel Co., Canton, O.

NICKEL STEEL

AGATHON—See Central Steel Co.

ALLEN & Co., Edgar, 718 W. Lake St., Chicago, Ill. (Importers.)

ARROW—See Crowley Co.

BECKER Steel Co. of America, 90 West St., New York, N. Y. (Importers.)

CARBON Steel Co., ft. 32d St., Pittsburg, Pa. "Nico."

CARPENTER Steel Co., Reading, Pa.

CENTRAL Steel Co., Massillon, O. "Agathon."

COLONIAL Steel Co., Keystone Bldg., Pittsburg, Pa.

CROWLEY Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."
(See page 699.)

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburg, Pa.

FITZSIMONS Co., 1623 Wilson Ave., Youngstown, O.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y.
(See page 491.)

HALCOMB Steel Co., Syracuse, N. Y.

HELMUTH, Co., L., 17 Battery Pl., New York, N. Y. (Importers.)

ILLINOIS Steel Co., 203 S. La Salle St., Chicago, Ill.

KRUPP—See Prosser & Son.

LA SALLE Steel Co., 2305 S. Halsted St., Chicago, Ill.

LINDENBERG Steel Co., 90 West St., New York, N. Y. (Importers.)

MIDVALE Steel Co. (Nicetown), Philadelphia, Pa.

NICO—See Carbon Steel Co.

PHILADELPHIA Steel & Forge Co., 50 Church St., New York, N. Y.

PITTSBURG Shafting Co. of Detroit, Detroit, Mich.

PITTSBURGH Tool Steel Wire Co., Monaca, Pa.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

UNION Drawn Steel Co., Beaver Falls, Pa.
(See page 489.)

UNITED Steel Co., Canton, O.

VULCAN Crucible Steel Co., First St., Aliquippa, Pa.

CHROME NICKEL STEEL

AGATHON—See Central Steel Co.

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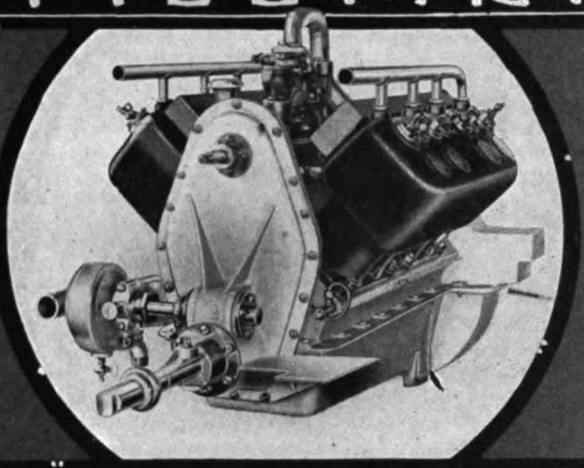

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We announce our preparedness to demonstrate and book contracts for eight cylinder V-type motors.

In line with our policy, this announcement comes only after these motors have been standardized—only after we have made sure that they are correct, not only in their main essentials but in the most minute detail.

The car manufacturer who selects either of the HERSCHELL-SPILLMAN Eights gets a motor that is a success—an equipment that insures maximum efficiency, flexibility and freedom from mechanical defects of any kind.

The same close limits that have established and sustained the fame of HERSCHELL-SPILLMAN four and six cylinder motors insure the success of the HERSCHELL-SPILLMAN Eights.

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Model V, 28.8 H.P. **Model V. A., 33.8 H.P.**

Actual Brake Pull at 2400 R.P.M., 70 H.P.

Cylinders Set at angle of 90° **No perceptible vibration even at highest speeds.**

SPECIFICATIONS

	"V"	"V.A"
Bore	3 in.	3¼ in.
Stroke	5 in.	5 in.
S.A.E. Rating	28.8 H.P.	33.8 H.P.
Actual Brake Pull at 2400 R.P.M.	70.0 H.P.	
Valve—Effective Diameter	1 7/16 in.	1 7/16 in.
Valve Lift	⅜ in.	⅜ in.
Crank Shaft Bearing, Front	2 x 3 in.	2 x 3 in.
Crank Shaft Bearing, Centre	2 x 3 in.	2 x 3 in.
Crank Shaft Bearing, Rear	2 x 3⅜ in.	2 x 3⅜ in.
Cam Shaft Diameter	1¼ in.	1¼ in.
Cam Shaft Bearing, Front	1 13/16 x 3 in.	1 13/16 x 3 in.
Cam Shaft Bearing, Centre	1¼ x 2½ in.	1¼ x 2½ in.
Cam Shaft Bearing, Rear	1¼ x 2 in.	1¼ x 2 in.
Connecting Rod Length	11 in.	11 in.
Connecting Rod Bearing, Diameter	1⅞ in.	1⅞ in.
Connecting Rod Bearing, Length	1 9/16 in.	1 9/16 in.
Piston Length	3½ in.	3½ in.
Piston Rings, three in number, width	3/16 in.	3/16 in.
Piston Pin Assembly	⅞ x 1⅞ in.	⅞ x 1⅞ in.
Firing Order	R-1, L-1, R-3, L-3, R-4, L-4, R-2, L-2	
Weight	550 lbs.	550 lbs.

Manufactured by

HERSCHELL-SPILLMAN COMPANY, **North Tonawanda, N. Y.**

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STEEL (Continued)

CHROME NICKEL STEEL (Continued)

AMERICAN Import & Export Co., 150 Nassau St., New York, N. Y. (Importers.)

ARBO—See Carbon Steel Co.

ARROW—See Crowley Co.

BECKER Steel Co. of America, 90 West St., New York, N. Y. (Importers.)

BISCHOFF—See Elliott, H. A.

CARBON Steel Co., ft. 32d St., Pittsburg, Pa. "Arbo," "Decco," "Shrapo."

CARPENTER Steel Co., Reading, Pa.

CENTRAL Steel Co., Massillon, O. "Agathon."

CROWLEY Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow." (See page 699.)

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburg, Pa. "Simplex," "Duplex."

DECCO—See Carbon Steel Co.

DUPLEX—See Crucible Steel Co. of America.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (See page 491.)

HALCOMB Steel Co., Syracuse, N. Y.

HELLER Bros. Co., Newark, N. J.

ILLINGSWORTH Steel Co., John (Frankford), Philadelphia, Pa.

ILLINOIS Steel Co., 208 S. La Salle St., Chicago, Ill.

KRUPP—See Prosser & Son.

LA SALLE Steel Co., 2305 S. Halsted St., Chicago, Ill.

LINDENBERG Steel Co., 90 West St., New York, N. Y. (Importers.)

McINNES Steel Co., Corey, Pa.

MAYARI—See Pennsylvania Steel Co.

MIDVALE Steel Co. (Nicetown), Philadelphia, Pa.

PENNSYLVANIA Steel Co., Morris Bldg., Philadelphia, Pa. "Mayari."

PHILADELPHIA Steel & Forge Co., 50 Church St., New York, N. Y.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

ROECHLING Electro Steel Co., 173-77 Lafayette St., New York, N. Y. (Importers.)

SHRAPO—See Carbon Steel Co.

SIMPLEX—See Crucible Steel Co. of America.

TUSCO—See United Steel Co.

UNION Drawn Steel Co., Beaver Falls, Pa. (See page 489.)

UNITED Steel Co., Canton, O. "Tusco."

VULCAN Crucible Steel Co., First St., Aliquippa, Pa.

VANADIUM STEEL

AGATHON—See Central Steel Co.

ALLEN & Co., Edgar, 713 W. Lake St., Chi-Ill. (Importers.)

ALVA—See Crucible Steel Co. of America.

CARNEGIE Steel Co., Carnegie Bldg., Pittsburg, Pa.

CENTRAL Steel Co., Massillon, O. "Agathon."

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburg, Pa. "Alva."

FITZSIMONS Co., 1623 Wilson Ave., Youngstown, O.

HALCOMB Steel Co., Syracuse, N. Y.

HARROW Spring Co., First National Bank Bldg., Milwaukee, Wis.

KRUPP—See Prosser & Son.

LA SALLE Steel Co., 2305 S. Halsted St., Chicago, Ill.

LUDLUM Steel Co., Watervliet, N. Y.

McINNES Steel Co., Corry, Pa.

MIDVALE Steel Co. (Nicetown), Philadelphia, Pa.

PITTSBURGH Tool Steel Wire Co., Monaca, Pa.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

UNION Drawn Steel Co., Beaver Falls, Pa. (See page 489.)

UNITED Steel Co., Canton, O.

VANADIUM-ALLOYS Steel Co., Latrobe, Pa. "Vasco."

VASCO—See Vanadium-Alloys Steel Co.

VULCAN Crucible Steel Co., First St., Ali-

HIGH-SPEED CUTTING STEEL

ALBION—See Hobson, Houghton & Co.

ALLEN & Co., Edgar, 713 W. Lake St., Chicago, Ill. (Importers.)

ANDREW & Co., J. H., 26 Cortlandt St., New York, N. Y. (Importers.) "Toledo."

ARK—See Jessop & Sons.

ARROW—See Crowley Co.

ATLAS Crucible Steel Co., 66 Howard Ave., Dunkirk, N. Y. "Loco."

BECKER Steel Co. of America, 90 West St., New York, N. Y. (Importers.)

BOHLERS—See Houghton & Richards.

BRAEBURN Steel Co., Braeburn, Pa.

BURGESS—See Cyclops Steel Works.

CAPITAL—See Nash Co.

CARDINAL—See Elliott, H. A.

CARPENTER Steel Co., Reading, Pa. "Star Zenith."

CLARITE—See Columbia Tool Steel Co.

COLONIAL Steel Co., Keystone Bldg., Pittsburg, Pa.

COLUMBIA Tool Steel Co., Chicago Heights, Ill. "Clarite."

CROWLEY Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow." (See page 699.)

CRUCIBLE Steel Co. of America, Oliver Bldg., Pittsburg, Pa. "Rex."

CYCLOPS Steel Works, 265 E. Spring St., Titusville, Pa. "Burgess."

DREADNOUGHT—See Halcomb Steel Co.

ELLIOTT, H. A., Majestic Bldg., Detroit, Mich. (Importer.) "Cardinal."

FEARLESS—See Hobson, Houghton & Co.

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (See page 491.)

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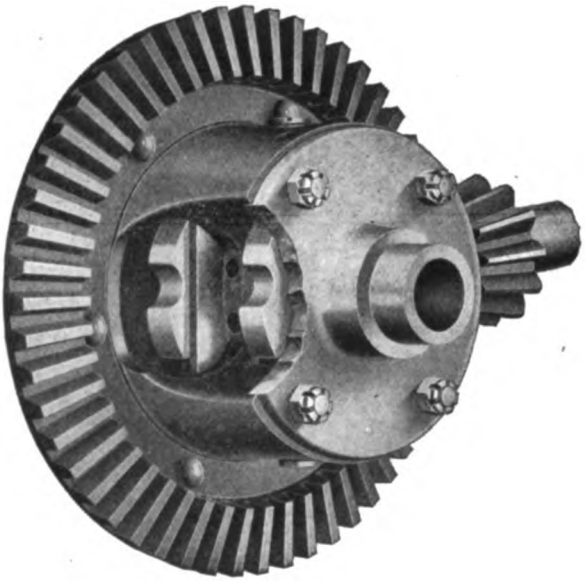

THE NEW PROCESS DIFFERENTIAL

CAR AND AXLE BUILDERS:

How much longer can you afford to close your eyes to the benefits of the New Process Gearless Differential?—the correct operating principle that lessens noise, wear, swerving, skidding, useless grind and side thrust on the tires.

Careful investigation of the New Process Gearless Differential would convince you that it offers decided improvement over the geared differential and has a simplicity and strength that assure constant and continued satisfaction.

You can make the change without altering your present axle housing and bearing layout, and we will back you with any reasonable service guarantee.

Licensed under patents of the
Gearless Differential Company of Detroit, Mich.

NEW PROCESS GEAR CORPORATION
SYRACUSE, N.Y

125

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STEEL (Continued)

HIGH-SPEED CUTTING STEEL (Continued)

HALCOMB Steel Co., Syracuse, N. Y. "Dreadnought."

HELLER Bros. Co., Newark, N. J.

HOBSON, Houghton & Co., 88 Beekman St., New York, N. Y. (Importers.) "Albion," "Fearless."

HOUGHTON & Richards, 145 Oliver St., Boston, Mass. "Bohlers."

IMPROVED CAPITAL—See Ward's Sons.

JESSOP & Sons, Wm., 91 John St., New York, N. Y. (Importers.) "Ark." (See page 489.)

JONES & Co., B. M., 141 Milk St., Boston, Mass. (Importers.) "Mushet."

LINDENBERG Steel Co., 90 West St., New York, N. Y. (Importers.)

LOCO—See Atlas Crucible Steel Co.

LUDLUM Steel Co., Watervliet, N. Y. "Mohawk," "Seneca."

McINNES Steel Co., Corry, Pa.

MIDVALE Steel Co. (Nicetown), Philadelphia, Pa.

MOHAWK—See Ludlum Steel Co.

MUSHET—See Jones & Co.

NASH Co., Geo., 217 Pearl St., New York, N. Y. (Importers.) "Capital." (See page 547.)

RED CUT SUPERIOR—See Vanadium-Alloys Steel Co.

REX—See Crucible Steel Co. of America.

ROECHLING Electro Steel Co., 173-77 Lafayette St., New York, N. Y. (Importers.)

SENECA—See Ludlum Steel Co.

STAR ZENITH—See Carpenter Steel Co.

TOLEDO—See Andrew & Co.

VANADIUM-ALLOYS Steel Co., Latrobe, Pa. "Red Cut Superior."

VULCAN Crucible Steel Co., First St., Aliquippa, Pa.

WARD'S Sons, Edgar T., 25 Purchase St., Boston, Mass. (Importers.) "Improved Capital." (See page 547.)

SELF-HARDENING CUTTING STEEL

ALLEN & Co., Edgar, 718 W. Lake St., Chicago, Ill. (Importers.)

BLUE CLIP—See Firth-Sterling Steel Co.

FIRTH-STERLING Steel Co., McKeesport, Pa. "Blue Clip."

HALCOMB Steel Co., Syracuse, N. Y.

HOBSON, Houghton & Co., 88 Beekman St., New York, N. Y. (Importers.) "Soho."

ILLINGSWORTH Steel Co., John (Frankford), Philadelphia, Pa.

JESSOP & Sons, Wm., 91 John St., New York, N. Y. (Importers.) (See page 489.)

JONES & Co., B. M., 141 Milk St., Boston, Mass. (Importers.) "Mushet."

MUSHET—See Jones & Co.

SOHO—See Hobson, Houghton & Co.

VULCAN Crucible Steel Co., First St., Aliquippa, Pa.

STEPS

FORGED STEPS

(See Forgings, Drop)

SPECIAL FOLDING STEPS

WEISS Co., 329 W. Market St., Indianapolis, Ind.

SPECIAL STEPS AND RUNNING BOARDS

BOSSERT Co., Utica, N. Y. (See page 279.)

BUFFALO Pressed Steel Co., Military Rd. & Lansing St., Buffalo, N. Y.

DETROIT Pressed Steel Co., 1800 Mt. Elliott Ave., Detroit, Mich. (See page 281.)

ERDLE Perforating Co., 7 Factory St., Rochester, N. Y.

FORSYTH Bros. Co., Chicago, Ill. (See page 241.)

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich. "Hayes-Stanwood."

HAYES-STANWOOD—See Hayes Mfg. Co.

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MOLINE Pressed Steel Co., East Moline, Ill.

MOTOR Parts Co., Plainfield, N. J. "Stanwood."

PARISH & Bingham Co., Cleveland, O. (See page 235.)

ROCHESTER Pressed Steel Co., 35-37 Ford St., Rochester, N. Y.

STANWOOD—See Motor Parts Co.

STONES

OIL STONES

(For cleaning platinum points on Spark Coils)

PIKE Mfg. Co., Pike, N. H.

STOVES

CAMP STOVES

MOATS—See Prentiss-Wabers Mfg. Co.

PRENTISS-WABERS Mfg. Co., 20 Spring St., Grand Rapids, Wis. "Moats."

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

STRAINERS

GASOLINE STRAINERS OR SEPARATORS

(For use between tank and carbureter to remove dirt and water. For Strainer Funnels—See Funnels, Gasoline)

ALLEN Wrench & Tool Co., Public & Eddy Sts., Providence, R. I.

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The Mott Wheel Works

UTICA, N. Y.

Oldest Rim Makers in America

Manufacturers of Automobile Rims,—Truck Bands in SAE and Millimeter sizes,—Wire wheels,—Pleasure car axles,—Motorcycle and Bicycle rims.

THE MOTT WHEEL WORKS

Utica, N. Y.

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STRAINERS (Continued)

GASOLINE STRAINERS OR SEPARATORS (Continued)

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BINGHAM Mfg. Co., West Park, O. "Shurecleen."

BOUSMAN Mfg. Co., 1126 Plainfield Ave., Grand Rapids, Mich. "Grand Rapids."

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

BUSH Mfg. Co., Hartford, Conn.
(See page 467.)

CRUM-WILEY Mfg. Co., Peru, Ind.

EMMONS Specialty Co., 241 E. Jefferson Ave., Detroit, Mich. "Esco."

ESCO—See Emmons Specialty Co.

FINDEISEN & Kropf Mfg. Co., 2125 Rockwell St., Chicago, Ill. "Rayfield."
(See page 135.)

G. & A. Carburetor Co., 450-52 Sixth Ave., New York, N. Y.

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y.

GRAND RAPIDS—See Bousman Mfg. Co.

HALLADAY Co., L. P., Streator, Ill.

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O. "Trusty."

McRAE & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

MICHIGAN Lubricator Co., 661-73 Beaubien St., Detroit, Mich.

MOSLER & Co., A. R., Mt. Vernon, N. Y.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

RAYFIELD—See Findeisen & Kropf Mfg. Co.

REYNOLDS, George T., 341-49 Eddy St., Providence, R. I.

SHURECLEEN—See Bingham Mfg. Co.

STROMBERG Motor Devices Co., Dept. S., 64 E. 25th St., Chicago, Ill.
(See page 137.)

10 IN 1 Strainer Co., 628 Fourth Ave., Brooklyn, N. Y.
(See page 785.)

TRUSTY—See Lunkenheimer Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WHEELER & Schebler, Indianapolis, Ind.
(See page 783.)

ZERK Mfg. Co., Cleveland, O.

STRAPS

ANTI-RATTLING HOOD STRAPS

CAMPBELL—See Perkins Campbell Co.

HOOVER Co., W. H., New Berlin, O.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

WINSHIP, W. W., 71 Summer St., Boston, Mass.

LEATHER STRAPS

AJAX Trunk & Sample Case Co., 144-50 W. 18th St., New York, N. Y.

ARMSTRONG & Graham, 128-32 Jefferson Ave., Detroit, Mich.

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BACKSTAY Machine & Leather Co., Oak & Howard Sts., Union City, Ind.

BADGER Handle Co., 323 E. Water St., Milwaukee, Wis.

BAILEY Co., R. B., 406 W. Pico St., Los Angeles, Cal.

BANTLIN Co., Julius J., 216 E. Third St., Cincinnati, O.
(See page 583.)

BAUER-LEWIS Co., 363 Holden Ave., Detroit, Mich.

BRACE Leather Goods Co., 22 Wayne St., Pontiac, Mich.

BUNGE Co., Otto, 1052 Dawson St., Indianapolis, Ind.

CAMPBELL—See Perkins Campbell Co.

CARTER Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

DECKER, J. C., Montgomery, Pa.

DESOCO—See Detroit Socket Co.

DETROIT Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

DUCKWALL Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

ECONOMY Stay Co., Jefferson City, Mo.

ETTINGER, M., 9-13 Ferry St., New York, N. Y.
(See page 583.)

FEESER Co., Frank S., 1103 Prospect St., Indianapolis, Ind. "Superior."

G & K—See Graton & Knight Mfg. Co.

GIVEN & Son Co., R., Sidney, O.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K."
(See page 103.)

HAGER & Son, Chas., 1876 Broadway, New York, N. Y.

HANISCH Sons, R., 121-23 N. Halsted St., Chicago, Ill.

HOFFELD & Co., R., 61-69 Carroll St., Buffalo, N. Y.

HOOVER Co., W. H., New Berlin, O.

JEWELL Belting Co., 15 Trumbull St., Hartford, Conn.

KELLEY, A. F., 173 S. Main St., Providence, R. I.

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FOR ALL MAKES OF CARS

1916 GREETINGS

FOR FORD CARS

NATHAN

Nathan Top and Wind Shield Connecting Curtain for Ford Cars

Nathan Wedge Shaped Back Rest Cushion

Nathan Fan Belts for Ford Cars

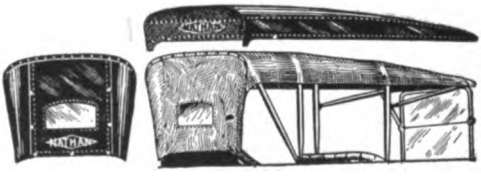
NATHAN SEAT AND UPHOLSTERY COVERINGS

Made in our own modernly equipped factory. As pioneer manufacturers of Automobile Fabric Supplies, with a force of expert designers, we have produced the line of Nathan Luxurious Seat and Upholstery Covers which is second to none regardless of price. They are made to cover the cushions, backs, doors and all the upholstery inside the car. They protect the upholstery on a new car, and by covering up the worn spots on an old car give it the appearance of one that has been newly upholstered. They embody all the latest scientific improvements in design and manufacture, namely, **Luxury, Durability, Perfect Fit, Easy to Attach and Detach, Low in Price.** Send for Samples and Prices. We have many recommendations from satisfied users.

Nathan Perfect Fitting Tire Covers

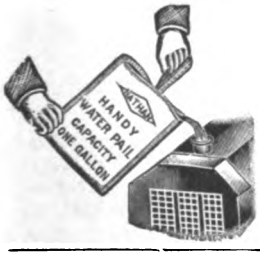
Fits Any Special Rim and Holder

Don't Buy a New Top



RECOVER THE OLD FORD FRAME WITH A NATHAN TOPPING OUTFIT FOR FORD CARS.

This outfit consists of roof, quarters, backs, stays and back curtain which are made complete with all necessary fastenings ready to easily slip over the old top frame. No extra stitching required. This outfit is made of the best quality heavy 32-ounce rubber auto topping which is remarkably durable. The back curtain is fitted with a large light and is arranged so that it may be rolled up.



OUR NEW CATALOG CONTAINING 40 PAGES, FULL OF DESCRIPTIONS AND ILLUSTRATIONS OF OUR ENTIRE LINE WITH MANY BRAND NEW NECESSITIES FOR FORD CARS AND ALL OTHER MAKES, WILL SOON BE READY. WRITE FOR IT.

Nathan Comfy Cushion

NATHAN NOVELTY MFG. CO.

Established 1900

Nathan Building, A 84, 86, 88, 90 Reade, New York City, U. S. A.

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STRAPS (Continued)

LEATHER STRAPS (Continued)

KRONAUER & Co., Chas., 152 N. Desplaines St., Chicago, Ill.

LEATHER Products Co., 715 Carr St., Cincinnati, O.

LEFKOWITZ, L., 1 Greene St., New York, N. Y.

MOONEY Belting Co., 844 W. Sixth St., Cincinnati, O.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NATIONAL Leather Mfg. Co., Niles, Mich.

PAGE Belting Co., Concord, N. H.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

REINHOLD Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

RHOADS & Sons, J. E., 12 N. Third St., Philadelphia, Pa.

SMITH & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.

SPECIALTY Harness Co., Dayton, Va.

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

STEVENS & Bro., A. A., 1234 Wabash Ave., Chicago, Ill.

STRECKER Bros. Co., 117-19 Putnam St., Marietta, O.

SUPERIOR—See Feeser Co.

SUTHERLAND Co., F. L., 139 Beaubien St., Detroit, Mich.
(See page 813.)

WAKEFIELD Sales Co., Trempealeau, Wis.

WARREN Leather Goods Co., 30 Austin St., Worcester, Mass.

WING Co., Charles, Amesbury, Mass.
(See page 857.)

REBOUND STRAPS

(See also Shock Absorbers; also Springs, Supplementary)

BADGER Handle Co., 323 E. Water St., Milwaukee, Wis.

BAUER-LEWIS Co., 363 Holden Ave., Detroit, Mich.

BRACE Leather Goods Co., 22 Wayne St., Pontiac, Mich.

BUCKEYE—See Central Brass & Fixture Co.

BUNGE Co., Otto, 1052 Dawson St., Indianapolis, Ind.

CARTER Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

DUPLEX—See Erie Motor Specialty Co

ERIE Motor Specialty Co., Erie, Pa. "Duplex."

FEESER Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

G & K—See Graton & Knight Mfg. Co.

GEISEL, Otto E., 706 Chestnut St., Philadelphia, Pa.
(See page 501.)

GILMER Co., L. H. (Tacony), Philadelphia, Pa.
(See page 105.)

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K."
(See page 103.)

HOOVER Co., W. H., New Berlin, O.

McGREGOR—See U. S. Auto Bumper Co.

MESINGER Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O.
(See page 207.)

SIERRA—See Sturges Co.

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal. "Sierra."

SUPERIOR—See Feeser Co.

U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."

STARTING CRANK STRAPS

(See Holders, Starting Crank)

WEB STRAPS

AMERICAN Mills Co. of New York, 395 Broadway, New York, N. Y.
(See page 321.)

BUFFALO Weaving & Belting Co., 234 Chandler St., Buffalo, N. Y.

CURRY Co., J. W., 2615 Cummins St., Cincinnati, O.

KERR Adjustable Strap Co., 220 Fifth Ave., New York, N. Y.

STRIPS

SPRING LEAF LUBRICATING STRIPS

AVERY Portable Lighting Co., 351 National Ave., Milwaukee, Wis.

DANN Products Co., 2290 Indiana Ave., Chicago, Ill.
(See page 837.)

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

SPILLER Co., H. A., 136 Federal St., Boston, Mass. "Springeze."
(See page 501.)

SPRINGEZE—See Spiller Co.

WONDER WORKER—See Hall-Thompson Co.

WIND SHIELD WEATHER STRIPS

McCORMICK—See Robinson Mfg. Co.

ROBINSON Mfg. Co., Lincoln Bldg., Louisville, Ky. "McCormick."

VANGUARD Mfg. Co., Detroit Mich.
(See page 455.)

SUPPLIES

DEALERS AND JOBBERS IN SUPPLIES

(This is a list of Dealers and Jobbers in Automobile Supplies who advertise in this publication)

M. & M. Co., 480-500 Prospect Ave., Cleveland, O.
(See page 843.)

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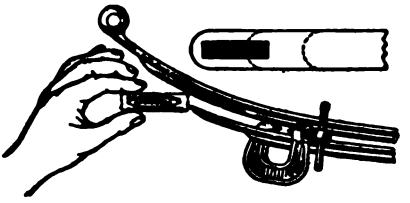

Price 60c per box containing 25 sticks
Agents wanted

Keep your SPRINGS in perfect condition

"SPRINGEZE"

as shown by tests secures a gain of from 5% to 8% in power, gives greater spring resiliency, breakage is reduced to a minimum and bearing surfaces kept smooth. It is unaffected by oil or water. Better than any other spring appliance on the market.

H. A. SPILLER CO.

136 Federal Street, Boston, Mass.

Screw Machine Products

All machine parts that can be made on **Hand** and **Automatic** Screw Machines from Steel, Brass and Bronze Rods or Gray or Malleable Iron Forgings, or from Aluminum.

THE BROWN BAG FILLING MACHINE COMPANY

Successors to
The J. M. Syme Company

20 Main Street Fitchburg, Mass.

CYLINDER CASTINGS

of the Highest Standard

"OUR SPECIALTY"

Campbell, Wyant & Cannon Fdy. Co.

MUSKEGON - MICHIGAN

GEISEL'S "PERFECTION" ENDLESS WEB BELT

Every user of flat belts will get more service and better service by using a belt which grips at low speed as tightly as at high speed. Such a belt means a power saving—sometimes as much as 20 per cent.

Use Geisel's "Perfection" Belts. They save power, time, breakdowns, stoppage, money, annoyance and give increased speed.

Dealers send at once for sample and trade prices.

OTTO E. GEISEL, 706 Chestnut St., Philadelphia, Pa.

PATENTED APRIL 28, 1903

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SUPPLIES (Continued)

DEALERS AND JOBBERS IN SUPPLIES (Continued)

MAJESTIC Mfg. & Specialty Co., 1355 Michigan Ave., Chicago, Ill.
(See page 819.)

POST & Lester Co., 112 Allyn St., Hartford, Conn.
(See page 781.)

MOTOR Car Equipment Co., 21 W. 62d St., New York, N. Y.
(See page 809.)

PRUDEN Hardware Co., W. E., 864-66 Eighth Ave., New York, N. Y.
(See page 735.)

REINHARD Bros. Co., Minneapolis, Minn.
(See page 817.)

ZINKE Co., Chicago, Ill.
(See pages 445 to 452.)

SUPPORTS

HOOD SUPPORTS OR ARCH BARS

CROSBY Co., Buffalo, N. Y.
(See page 699.)

KONIGSLOW Mfg. Co., Otto, E. 35th St. & Perkins Ave., Cleveland, O.

METAL Specialty Co., Cincinnati, O.

MOLINE Pressed Steel Co., East Moline, Ill.

SWITCHES

AUTOMATIC CUT-OUT SWITCHES

(For cutting out lights automatically when motor is not running)

PRICE Electric & Mfg. Co., Basic City, Va.

AUTOMATIC TIME SWITCHES

(For automatically turning the current on or off when charging storage batteries)

CAMPBELL Electric Co., Lynn, Mass.

CRESCENT—See McGill Mfg. Co.

GENERAL Electric Co., Schenectady, N. Y.

McGILL Mfg. Co., 34 Oak St., Valparaiso, Ind. "Crescent."

SORENSON, P., 18 Dunham Pl., Brooklyn, N. Y.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

ELECTRIC STARTER SWITCHES

(See also Starters, Electric)

BRIGGS & Stratton Co., 258 Milwaukee St., Milwaukee, Wis.

CUNO Engineering Corp., 80 S. Vine St., Meriden, Conn.

H & H—See Hart & Hegeman Mfg. Co.

HART & Hegeman Mfg. Co., 342 Capitol Ave., Hartford, Conn. "H & H."

HARTMAN Electrical Mfg. Co., Mansfield, O.

INDUSTRIAL Controller Co., 886 Greenbush St., Milwaukee, Wis.

FOOT SWITCHES

HERZ & Co., 245 W. 55th St., New York, N. Y.
(See page 389.)

HORN SWITCHES

SENG, W. P., 1448 Dayton St., Chicago, Ill.
(See page 505.)

IGNITION SWITCHES

AMPCO—See S-M Novelty Mfg. Co.

ATWATER Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa.

BRIGGS & Stratton Co., 258 Milwaukee St., Milwaukee, Wis.

CHICAGO Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

CLUM Mfg. Co., Montgomery Bldg., Milwaukee, Wis.

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

COUCH CO., S. H., 170 Purchase St., Boston, Mass. "Puritan."

DOW Mfg. Co., 131 Adams St., Braintree, Mass.

FAW, J. H., 41 Warren St., New York, N. Y. "Fawsco."
(See page 845.)

FAHNESTOCK Electric Co., 129 Patchen Ave., Brooklyn, N. Y.

FAULTLESS—See Motsinger Device Mfg. Co.

FAWSCO—See Faw, J. H.

HANDY—See Chicago Electric Mfg. Co.

IDEAL Switch Co., Plainville, Conn.

KINGSTON—See Kokomo Electric Co.

KNOBLOCK-HEIDEMAN Mfg. Co., Sample St. & Vistula Ave., South Bend, Ind. "Quick Action."

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

MORSE, Frank W., 293 Congress St., Boston, Mass.
(See page 517.)

MOTSINGER Device Mfg. Co., Lafayette, Ind. "Faultless."

NEW York Coil Co., 344 Pearl St., New York, N. Y.
(See page 635.)

PITTSFIELD Spark Coil Co., Pittsfield, Mass.
(See page 169.)

PURITAN—See Couch Co.

QUICK ACTION—See Knoblock-Heideman Mfg. Co.

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

S-M Novelty Mfg. Co., 52d St. & Baltimore Ave., Philadelphia, Pa. "Ampco."

SPLITDORF Electrical Co., Newark, N.J.

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WILLIAMS, E. Q., 535-39 S. Clinton St., Syracuse, N. Y.

Complete Index to Classification appears on Pages 8 to 27.

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MALUMINUM

IS

Malleable Aluminum

The only piston metal left that does stand the necessary requirements

After extensive tests it has been demonstrated and proven by engineers that pistons made of MALUMINUM possess unusual strength, lightness, and do not collect carbon nor pound. Heat will not affect Maluminum Pistons, and they will not grow. Less clearance is necessary than in any other type of alloy piston.

Maluminum, being a bearing metal, will outlast pistons made from other metals and are always made without bushings.

Maluminum is the ideal aluminum alloy for use in the manufacture of crankcases, transmission cases, clutch cones and other parts where strength combined with lightness is essential.

Engineers, Write for Details
From the Originator

H. D. KRAMM FOUNDRY CO.

1125 East Georgia St., Indianapolis, Indiana

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SWITCHES (Continued)

KICK SWITCHES

(See Switches, Ignition)

LIGHT SWITCHES

(For turning on and off electric lights on car)

BRIGGS & Stratton Co., 258 Milwaukee St., Milwaukee, Wis.

CHAPMAN—See Morse, Frank W.

CHICAGO Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

CLUM Mfg. Co., Montgomery Bldg., Milwaukee, Wis.

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

CULVER-STEARNS Mfg. Co., Detroit, Mich.
(See page 699.)

CUNO Engineering Corp., 30 S. Vine St., Meriden, Conn.

CUTLER Hammer Mfg. Co., 12th St. & St. Paul Ave., Milwaukee, Wis.

DIAMOND H—See Hart Mfg. Co.

EUREKA—See Morse, Frank W.

GENERAL Electric Co., Schenectady, N. Y.

H & H—See Hart & Hegeman Mfg. Co.

HANDY—See Chicago Electric Mfg. Co.

HART Mfg. Co., Hartford, Conn. "Diamond H."

HART & Hegeman Mfg. Co., 342 Capitol Ave., Hartford, Conn. "H & H."

HARTMAN Electrical Mfg. Co., Mansfield, O.

IDEAL Switch Co., Plainville, Conn.

L-N—See Leece-Neville Co.

LEECE-NEVILLE Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

MORSE, Frank W., 293 Congress St., Boston, Mass. "Chapman," "Eureka," "Puritan," "Pullrite," "Starite."
(See page 517.)

NORTH East Electric Co., Rochester, N. Y.
(See page 487.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y.
(See page 223.)

PULLRITE—See Morse, Frank W.

PURITAN—See Morse, Frank W.

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

STARITE—See Morse, Frank W.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

LOCK SWITCHES

(Ignition switches equipped with lock to prevent unauthorized use of car)

AMPER Electric Co., 453 Willow St., Lockport, N. Y.

AUTO Lock Co., Rochelle, Ill. "Coeko."

AUTOMOBILE Combination Lock Co., St. Louis, Mo.

B-M—See Bass-Moody Co.

BASS-MOODY Co., 117 S. Washington St., Peoria, Ill. "B-M."

BLACKBURN Specialty Co., 3405-09 Perkins Ave., Cleveland, O. "Blaco."

BLACO—See Blackburn Specialty Co.

CLUM Mfg. Co., Montgomery Bldg., Milwaukee, Wis.

COEKO—See Auto Lock Co.

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

DELTA-STAR Electric Co., 617-31 W. Jackson Blvd., Chicago, Ill.

ESCO Mfg. Co., 23-25 Warren Ave., W., Detroit, Mich.

EVERETT Mfg. Co., 162-64 N. May St., Chicago, Ill.

H. P. B. Electric Co., 500 Fifth Ave., New York, N. Y.

LAWRENCE Specialty Co., Boston, Mass.

SAFETY Device Co., 372 S. Illinois St., Indianapolis, Ind.

SLY Mfg. Co., W. W., Cleveland, O.

SPARK PLUG SWITCHES

BAILEY Co., Wm. J., 401-07 Mulberry St., Newark, N. J. "C-B."

C-B—See Bailey Co.

MANVILLE, Geo. W., Bridge St., Towanda, Pa.

MEANS, Eugene D., Towanda, Pa.

STEERING WHEEL SWITCHES

(Ignition Switches for attachment to Steering Wheel)

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

CULVER-STEARNS Mfg. Co., Detroit, Mich.
(See page 699.)

SYSTEMS

ELECTRIC LIGHTING SYSTEMS

(See also Dynamos, Electric Lighting)

ADAMS-BAGNALL Electric Co., Cleveland, O.

APELCO—See Apple Electric Co.

APPLE Electric Co., Newark, N. J. "Apelco."

DAYTON Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."

DELCO—See Dayton Engineering Laboratories Co.

DISCO Electric Starter Corp., Detroit, Mich.
(See page 651.)

DYNETO Electric Co., Syracuse, N. Y.
(See page 487.)

ECONOMY Electric Co., Economy, Pa.

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HAMILTON MADE

The Highest Quality Tube Producible

PERFECTION PINK TUBES

THE STANDARD OF AMERICA

It has been our ambition to produce a hand-made tube of the choicest materials and the finest workmanship. The quality is apparent all over **PERFECTION PINK TUBES** and the extra thickness will convince you at a glance of their reliable and expensive manufacture. An extra strong steam cured valve patch, and a guaranteed splice which positively cannot separate are features which have been given exceptional attention.

PERFECTION PINK TUBES are never porous, are positively uniform in quality, everyone having been given the minutest inspection with the greatest care. **PERFECTION PINK TUBES** because of their high quality and excellent construction positively retain their size and shape so that unlike other tubes, they do not stretch and make their reinsertion difficult.

We still have some unoccupied territory which will prove highly profitable to the right representatives, for here is indeed the tube that has been looked for, **the better tube at a little better price.**

THE HAMILTON RUBBER MFG. CO.

TRENTON, N. J.

Standard size $3.00
Ford size 2.50

When Danger Threatens

the automobile driver needs both hands on the steering wheel.

He can't afford to waste the fractional instant it takes to reach for a horn, button or the steering post, the dash, the door or some other inaccessible place.

The Seng Switch

crashes out a warning from the electric horn as quick as thought when danger comes, without the driver removing either hand from the steering wheel.

Dealers—Jobbers—Garagemen

Here is the best "Safety First" device on the market. This is a splendid dealers' proposition for you. Fully guaranteed in every particular. Write today for particulars.

W. P. SENG

1448 Dayton St., Chicago, Ill.

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SYSTEMS (Continued)

ELECTRIC LIGHTING SYSTEMS (Continued)

ESTERLINE Co., 228 E. South St., Indianapolis, Ind.

HENRICKS Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind. (See page 651.)

HOLTZER-CABOT Electric Co., Roxbury, Mass.

JESCO—See Jones Electric Starter Co.

JONES Electric Starter Co., 1400 W. Adams St., Chicago, Ill. "Jesco."

L-N—See Leece-Neville Co.

LEECE-NEVILLE Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

LEONARD Electric Co., Ward, Mt. Vernon, N. Y.

NORTH East Electric Co., Rochester, N. Y. (See page 487.)

SAMSON Engineering Co., Louisville, Ky.

U-S-L—See U S Light & Heat. Corp.

U S Light & Heat. Corp., Niagara Falls, N. Y. "U-S-L." (See page 295.)

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

SINGLE SPARK IGNITION SYSTEMS

ATWATER Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa. "Unisparker."

BRIGGS Magneto Co., Elkhart, Ind. "Nash."

CONNECTICUT Telephone & Electric Co., Meriden, Conn. (See pages 508 and 509.)

NASH—See Briggs Magneto Co.

NEW York Coil Co., 344 Pearl St., New York, N. Y. "Rhoades." (See page 635.)

REMY Electric Co., Anderson, Ind. (See page 733.)

RHOADES—See New York Coil Co.

SEVISON Electric Co., McDonald & Richmond Sts., Elkhart, Ind.

UNISPARKER — See Atwater Kent Mfg. Works.

TACKS

UPHOLSTERY TACKS

ATLAS Tack Co., Fairhaven, Mass.

CLEVELAND Tack Works, 1313 E. 49th St., Cleveland, O.

COBB & Drew, Plymouth, Mass.

CRANDAL, Stone & Co., Binghamton, N. Y. "Lethermet." (See page 469.)

CROWN—See Roberts, G. G.

EAGLE—See Turner & Seymour Mfg. Co.

GENESEE Tack Co., 39-57 Mt. Hope Ave., Rochester, N. Y.

GRAND Crossing Tack Co., (Grand Crossing), Chicago, Ill.

HIGGIN Mfg. Co., Newport, Ky.

LEATHERLIKE—See Turner & Seymour Mfg. Co.

LETHERMET—See Crandal, Stone & Co.

MILONITE—See Morley Mfg. Co.

MILWAUKEE Tack Co., 27th Ave. & Wahl St., Milwaukee, Wis.

MORLEY Mfg. Co., 120 Boylston St., Boston, Mass. "Milonite."

NEIDER Co., F. A., Augusta, Ky.

PLYMOUTH Mills, Plymouth, Mass.

READE, Chas. W., 346 Sherman Ave., New Haven, Conn.

REGAL—See Roberts, G. G.

RIPLEY & Bartlett Co., Water St., Plymouth, Mass.

ROBERTS, G. G., South Ave., Whitman, Mass. "Crown," "Regal."

SALMOND & Son, Sam, Hanover, Mass.

SHELTON Co., Shelton, Conn.

TOCKWOTTON Co., 79 S. Main St., Providence, R. I.

TOWER Mfg. Co., Madison, Ind.

TURNER & Seymour Mfg. Co., Torrington, Conn. "Eagle," "Leatherlike."

WATERMAN Co., R. C., Water St., South Hanover, Mass.

TALC

TIRE TALC

ARNSTEIN, Eugene, 46th St. & Wentworth Ave., Chicago, Ill. "Century."

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Prevento." (See page 177.)

BESTYET—See St. Louis Rubber Cement Co.

CENTURY—See Arnstein, Eugene.

COHUTTA Talc Co., Dalton, Ga.

CRUM Mfg. Co., 120 N. Main St., Ottawa, Kans.

DOGGETT, Stanley, 11-13 Cliff St., New York, N. Y.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie." (See pages 189 to 192.)

FAULTLESS—See Hawkeye Oil Co.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

JEWEL—See Wadsworth-Howland Co.

MOBO—See Stanley, John T.

MOTOR Mica Mfg. Co., 1110 N. Clark St., Chicago, Ill. (See page 823.)

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NEVINS Co., Samuel, 100 E. Second St., Philadelphia, Pa.

NORTHWESTERN Chemical Co., Marietta, O. "Slip-Easy." (See pages 172 and 173.)

Complete Index to Classification appears on Pages 8 to 27.

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Phenomenal!

That is the Proper Way
To Characterize Our

SUCCESS WITH

Automobile Lamps

CORCORAN-VICTOR CO.
CINCINNATI, OHIO

ALL RECORDS SMASHED

FOR DOUBLE SERVICE

$5 VAPO-HUMIDIFIER $5

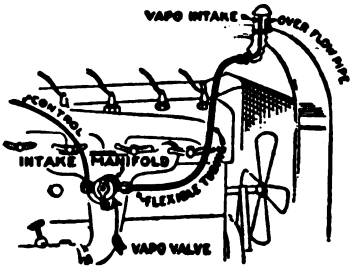
"Two Services for One Price"

Try It for 30 Days—Your Money Back if It Does Not Make Good.
Recommended by Thousands of Enthusiastic Uerss. Guaranteed. Uuconditional.

Carbon Eliminator

The vapor from the radiator being injected into the manifold in proper proportions absolutely prevents the accumulation of carbon, which always insures—

More Power **More Snap to Motor**
Clean Spark Plugs, insuring even firing at all times **No Carbon Knocks**
Smoother Running Motor
No More Expense for Cleaning Cylinders
No Time and Money Lost on Account of Car Being Laid Up for Overhauling
Makes Driving More Fascinating



Gasoline Saver

Cuts Gasoline Cost 5c to 10c per gallon

The Vapo-Humidifier produces a 100% combustible mixture at all times by injecting clean air and vapor from the radiator into the manifold and not dusty, gritty air from under the hood.

It produces the same results in all weather, wet or dry, night or day, giving 25% to 50% more mileage, power and speed.

Write for circular showing letters of recommendations from some of the largest firms in the country.

Fits Any Car—Attached in Few Minutes.

DEALERS—AGENTS—SALESMEN

Here is the fastest and easiest selling auto accessory ever put before you.
There is nothing like it offered—nothing just as good.
Our guarantee protects you **absolutely. We have yet to refund the first $5.**
Our big advertising campaign will bring people to you. Write or wire for exclusive territory, or come and see us—**do it now.**

AUTO GAS SAVER CO. (Not Inc.) Desk E, 540 National Life Bldg., Chicago, Ill.

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CONNECTICUT

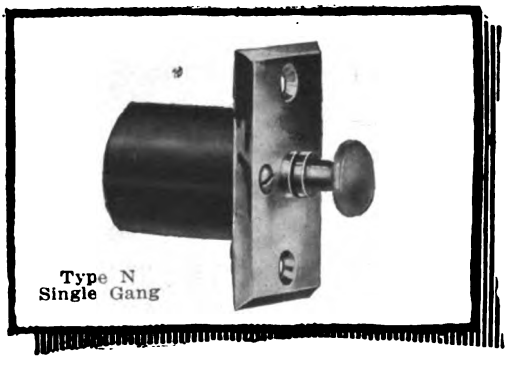
Connecticut Master Vibrator and Switch for Ford Cars

The modern tendency has been to remove unsightly and protruding instruments from the dash of the car and to mount things flush and out of the way, and the Connecticut Vibrator is covering the field of the concealed type of vibrator. This not only makes it possible to mount this vibrator on the later cars where dashes are more restricted for room, but puts the coil itself out of the way, leaving only a small escutcheon plate and switch lever in sight.

Our switch is neat, large enough to be operated by the foot, and further has a removable lever, affording a lock on your car.

These vibrators are packed in boxes, suitable for mailing, and in each box we furnish complete wiring diagram and the only necessary wire already equipped with soldered terminals for attaching to the coil, which makes it possible for the most inexperienced to put this vibrator on.

Price .....$9.00 Standard packages of 25 vibrators



Type N
Single Gang

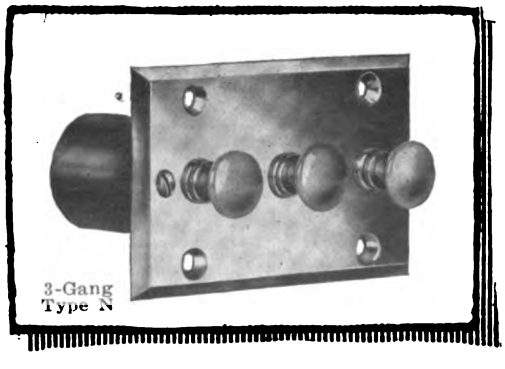
LIGHTING SWITCHES

Single Gang Type "N" Switch

This is the neatest, simplest and most easily installed switch on the market. All that is necessary is to bore a circular hole, or in case of a multiple gang switch, holes with ⅞ inch centers.

One marked advantage is that the button is large enough to be operated with a gauntleted hand.

All switches are provided with terminals.



3-Gang
Type N

TYPE "N"

Primarily for lighting as pulling out button closes an individual circuit and pushing it in opens the circuit. Multiple gang switches have a common bus bar for the battery wires.

Type	Mounting Plate	Stand. Pack	Price
1 Pt.	1½" high x 1" wide	24	$0.50
2 Pt.	1½" high x 1⅞" wide	24	1.00
3 Pt.	1½" high x 2¾" wide	24	1.50
4 Pt.	1½" high x 3⅝" wide	12	2.00

CONNECTICUT

Meriden

Manufacturers of Connecticu

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CONNECTICUT

LIGHTING SWITCH FOR FORDS

This is our regular construction but of special design and finish to harmonize with Ford car. It has a metal button and same as furnished the Ford Motor Company. Made in one point only.

Standard packages of 24
Each.....$0.50

Lighting Switch for Fords

TYPE C

Two-button switch incorporating a resistance. The first button to control head lights and tail light together and the second button to introduce the resistance in the circuit for dimming.

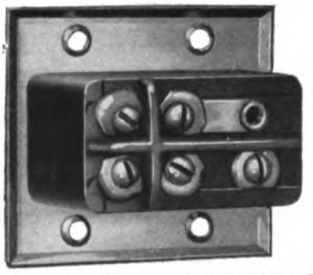
List.....$1.25

Type C Dimming

TYPE ND

Two-button switch which, without any change, can be used for series dimming or to control head and side lights or large and small bulbs in headlights. In all cases one button puts "on" and "off" all the lights of the car. In series dimming the other button throws the lights from multiple to series wiring, thereby dimming.

List.....$1.25

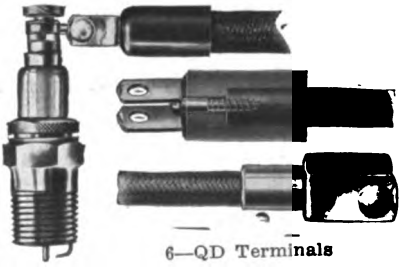


Type ND

CONNECTICUT QD TERMINALS

Cut shows application to plug with adapter:

QD Terminal $0.50
Ball Nuts ..... .02
Adapters ..... .03



6—QD Terminals

TEL. & ELEC. CO.

Conn.

Automatic Ignition Systems

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TALC

TIRE TALC (Continued)

POUGHKEEPSIE Utilities Corp., 14 Winnikee Ave., Poughkeepsie, N. Y. "Utility."

PREVENTO—See Atlas Auto Supply Co.

REFLEX Ignition Co., 1710 Payne Ave., Cleveland, O.
(See page 675.)

RIE-NIE—See Durkee-Atwood Co.

ST. LOUIS Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "Bestyet."

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich.

SLIP-EASY—See Northwestern Chemical Co.

STANDARD Chemical Co., 2921 Stevens Ave., Minneapolis, Minn.

STANLEY, John T., 642 W. 80th St., New York, N. Y. "Mobo."

STEWARD Mfg. Co., D. M., Chattanooga, Tenn.

U. S. Mica Mfg. Co., Lytton Bldg., Chicago, Ill.

UTILITY—See Poughkeepsie Utilities Corp.

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

WHITTAKER, W. H., 245 Front St., New York, N. Y.

WILLIAMS & Co., C. K., N. 13th St., Easton, Pa.

WONDER WORKER—See Hall-Thompson Co.

TANKS

ACETYLENE TANKS

FIREBALL Gas Tank & Illuminating Co., 5010 Delmar Blvd., St. Louis, Mo.

INTERNATIONAL Acetylene Co., Middletown, Conn. "Meteor."

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind.
(See page 553.)

METEOR—See International Acetylene Co.

TOWER Mfg. Co., Madison, Ind.

SEARCHLIGHT Co., 1016 Karpen Blvd., Chicago, Ill.

EMERGENCY OR RESERVE TANKS

(For carrying a reserve supply of gasoline or oil)

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

VOGEL & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.

FUEL AND WATER TANKS

A. B. & B. Specialty Co., 764 Windlake Ave., Milwaukee, Wis.

A-H Mfg. Co., 2076 E. 22d St., Cleveland, O.

A-Z Co., 530 W. 56th St., New York, N. Y.
(See page 417.)

AIR-TIGHT Steel Tank Co., Oliver Bldg., Pittsburg, Pa.

AMERICAN Brewers & Bottlers Specialty Co., Fourth St. & Windlake Ave., Milwaukee, Wis.

AUTO Metal Co., 531 Worthington St., Springfield, Mass.
(See page 107.)

AUTO Radiator Mfg. Co., 764-66 W. Van Buren St., Chicago, Ill.
(See page 791.)

AUTOCRAFT—See Craftsmen Motor Corporation.

AUTOMOBILE Hospital Co., 2076 E. 22d St., Cleveland, O.

BADGER & Sons Co., E. B., 68-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Woodward & Baltimore Aves., Detroit, Mich.

BUSH Mfg. Co., Hartford, Conn.
(See page 467.)

BUSHNELL Tank Works, Bushnell, Ill.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

CORNWALL Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.
(See page 739.)

CRAFTSMEN Motor Corporation, 2815-19 S. Wabash Ave., Chicago, Ill. "Autocraft."
(See page 573.)

DETROIT Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

EVANS Mfg. Co., First Ave. & 21st St., Moline, Ill.

FEDERAL Pressed Steel Co., Milwaukee, Wis.
(See page 783.)

FREELAND Sons Co., B. F., Sturgis, Mich.

GEUDER, Paeschke & Frey Co., 1363-1700 St. Paul Ave., Milwaukee, Wis.
(See page 479.)

GOETZ Co., 1802 Clybourn Ave., Chicago, Ill.

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

HUNT & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.

ILLINOIS Auto Sheet Metal Works, 1712-14 Michigan Ave., Chicago, Ill.

JANNEY, Steinmetz & Co., Philadelphia, Pa. "Jasco."
(See page 515.)

JASCO—See Janney, Steinmetz & Co.

JOHNSON'S Automobile Sheet Metal Works, W. N., 620-28 South J St., Richmond, Ind.

KELLS Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y.
(See page 261.)

KEYSTONE Sheet Metal Co., Ambridge, Pa.

KOVEN & Bro., L. O., 154 Ogden St., Jersey City, N. J.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco."
(See page 617.)

LONG Mfg. Co., Detroit, Mich.
(See page 421.)

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MICHIGAN Stamping Co., 759-71 Bellevue Ave., Detroit, Mich.

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

Complete Index to Classification appears on Pages 8 to 27.

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Rapidayton
Quick Measuring Pump

Large Capacity: Delivers 5 gallons on 12 crank turns, 2½ gallons on 6 crank turns; 2, 1 or ½ gallons in proportion.

Gears and rack are machine-cut, insuring easy operation and freedom from wear.

Quick Return Stroke

Downward stroke of piston is 4 times faster than upward pumping stroke, thus eliminating 80% of the idle crank turns.

4 Times Faster

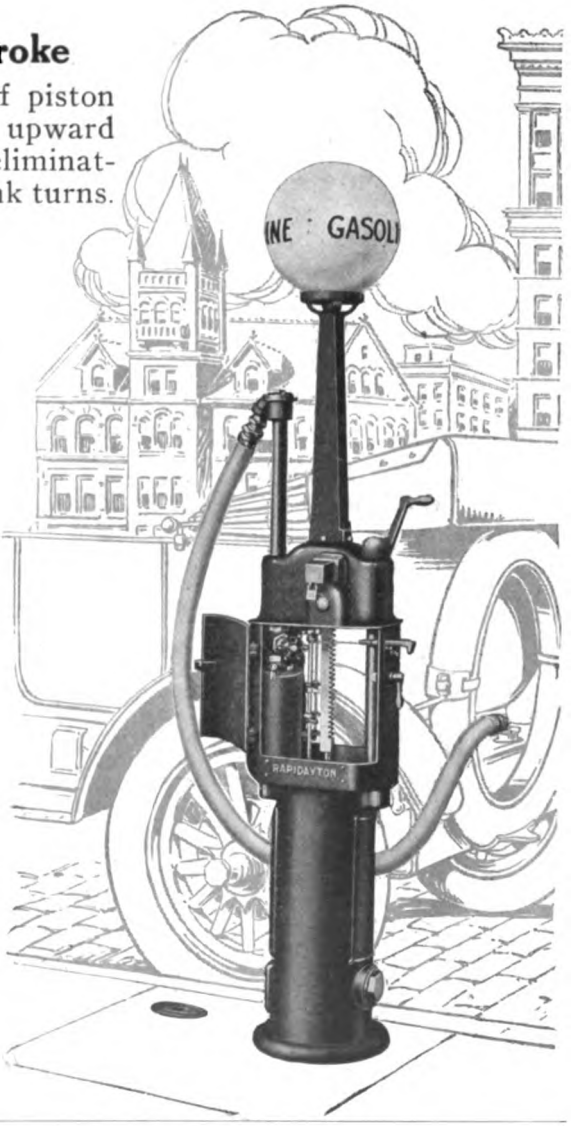
Slow stroke gallon pumps require 45 crank turns (of which half are idle back turns) to deliver 5 gallons. The Rapidayton does it on 12 turns, of which only two are back turns. It is even faster than the 5 gallon cylinder pumps, which require from 16 to 25 crank turns.

Accessible Valves.
Improved Filler.
100,000 Gallon Meter.
Set Back Gallon Counter.
Self-Draining Hose
Quick-Closing Nozzle.
Double-Brass Foot Valves.

Write for Bulletin G-3

Pumps and Complete Systems for Garages, Filling Stations and Factories.

The Dayton Pump & Mfg. Co.
Dayton, Ohio, U. S. A.



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TANKS (Continued)

FUEL AND WATER TANKS (Continued)

MURRAY Mfg. Co., J. W., 550-60 Clay Ave., Detroit, Mich.

NATIONAL Can Co., Detroit, Mich. (See page 629.)

PARAGON Auto-Parts Mfg. Co., 506 W. 53d St., New York, N. Y.

PERFEX Radiator Co., Racine, Wis.

PRESSED Steel Tank Co., West Allis, Wis.

R. & H. Sheet Metal Co., 109 Center Ave., Abington, Mass.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SCAIFE & Sons Co., Wm. B., Pittsburgh, Pa. (See page 515.)

SHOTWELL-HOBART-JOHNSON Co., 712-22 Ontario Ave., N., Minneapolis, Minn.

TODD Mfg. Co., 820-24 Mary Pl., Minneapolis, Minn.

TRAGESER Steam Copper Works, John, 447-57 W. 26th St., New York, N. Y.

WEBER Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill. (See page 793.)

WELDED Steel Barrel Corp., Hart & Charlevoix Sts., Detroit, Mich.

WESTERN Drop Forge Co., Marion, Ind. (See page 821.)

WILSON & Bowen, 1318 S. Main St., Los Angeles, Cal.

WISCONSIN Automobile Radiator Co., North Milwaukee, Wis.

XARDELL Bros. Co., 23 Broadway, Utica, N. Y.

GASOLINE STORAGE TANKS AND SYSTEMS

ACRO—See Tokheim Mfg. Co.

ADVANCE Pump & Tank Works, 1129-31 N. Sixth St., St. Louis, Mo.

AIR-TIGHT Steel Tank Co., Oliver Bldg., Pittsburg, Pa.

AMERICAN Oil Pump & Tank Co., Central & Kindel Aves., Cincinnati, O.

ANCHOR Brass Works, 141-43 W. Austin Ave., Chicago, Ill. "Savo."

BEMAN Automatic Oil Can Co., Meadville, Pa.

BIG GUSHER—See Western Oil Pump & Tank Co.

BIGGS Boiler Works Co., Akron, O.

BOWSER & Co., S. F., Fort Wayne, Ind.

BUTLER Mfg. Co., 1324 Grand Ave., Kansas City, Mo.

CHAMPION—See Cleveland Faucet Co.

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O. "Champion."

COLUMBIAN Steel Tank Co., 1605 W. 12th St., Kansas City, Mo.

DAYTON Pump & Mfg. Co., Dayton, O. "Rapidayton." (See page 511.)

DELPHOS Mfg. Co., 100-24 S. Pierce St., Delphos, O.

EASTERN Oil Tank Co., 146 Fletcher St., Lowell, Mass.

FARR Co., Frederick G., 79 Pacific Ave., Detroit, Mich.

FREELAND Sons Co., B. F., Sturgis, Mich. "Pioneer."

GILBERT & Barker Mfg. Co., Springfield, Mass.

GROETKEN Pump Co., 171 Middle Ave., Aurora, Ill.

GUARANTEE Pump Co., Rochester, N. Y.

HACO—See Heller-Aller Co.

HARRY Steel Co., O. K., 2838-35 Papin St., St. Louis, Mo.

HAWKEYE—See Tokheim Mfg. Co.

HEIL Co., 26th & Montana Aves., Milwaukee, Wis. "Quality."

HELLER-ALLER Co., Napoleon, O. "Haco."

HULL Pump & Tank Co., Owensboro, Ky.

HYDRAULIC Oil Storage & Engineering Co., 22 Albany St., New York, N. Y. "Snells."

IDEAL—See Janney, Steinmets & Co.

IDEAL—See Kupferle Bros. Mfg. Co.

IMPERIAL—See Western Oil Pump & Tank Co.

INGLIS Mfg. Co., 283 Fifth Ave., Milwaukee, Wis.

JANNEY, Steinmets & Co., Philadelphia, Pa. "Ideal." (See page 515.)

KEWANEE Private Utilities Co., Kewanee, Ill.

KOVEN & Bro., L. O., 154 Ogden St., Jersey City, N. J.

KUPFERLE Bros. Mfg. Co., 600-04 N. Second St., St. Louis, Mo. "Ideal."

LEADER Iron Works, Decatur, Ill.

LEETONIA Boiler Co., Leetonia, O.

LITTLE GEM—See Western Oil Pump & Tank Co.

LITTLE SAMPSON—See Western Oil Pump & Tank Co.

MILWAUKEE Tank Works, 146-56 Clinton St., Milwaukee, Wis.

MOGUL—See Western Oil Pump & Tank Co.

NATIONAL Store Specialty Co., Bareville, Pa. "Pennsylvania."

NEIL & Co., Wm., 617 Division St., Chicago, Ill.

NILES Steel Tank Co., Niles, Mich.

NON-EXPLOSIVE Can Co., 127-29 S. Green St., Chicago, Ill. "Peerless."

NORWICH Storage Tank Co., Lackawanna Ave., Norwich, N. Y.

OFF & Co, Christian, 5 N. New Jersey St., Indianapolis, Ind.

PEERLESS—See Non-Explosive Can Co.

PENNSYLVANIA—See National Store Specialty Co.

PERFECTION—See Western Oil Pump & Tank Co.

PIONEER—See Freeland Sons Co.

QUALITY—See Heil Co.

RAPIDAYTON—See Dayton Pump & Mfg. Co.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SAVO—See Anchor Brass Works.

SCAIFE & Sons Co., Wm. B., Pittsburg, Pa. (See page 515.)

SEXTON Can Co., 223 Franklin St., Boston, Mass.

Complete Index to Classification appears on Pages 8 to 27.

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Send for this Big Folder for the Last Word in Curb Pumps

It Tells—

—of a pump that delivers twenty gallons a minute—

—a pump that requires no *backward* strokes—

—a pump with a big clock dial that tells the customer exactly how much "gas" he is getting every turn of the crank—

—a line of pumps with FILTERS so efficient that we *guarantee* water-free, dirt-free gasoline.

It tells of small and less expensive curb pumps.

It describes efficient modern systems for handling gasoline, kerosene, paint oils, harvester oils, etc., inside the store.

HOW WE CO-OPERATE

We have also worked out a plan by which dealers who buy Wayne pumps are given good-sense help in bringing in the consumer-buyer.

OUR CUSTOMERS LIKE US

They like our attitude toward them—our willingness and intelligence in serving—our habit of entering into their problems and consulting their wishes.

Write for the big circular, as well as catalogues, prices, etc.

The Wayne Monarch

Wayne Oil Tank & Pump Company

16 Canal St., Fort Wayne, Ind.

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TANKS (Continued)

GASOLINE STORAGE TANKS AND SYSTEMS (Continued)

SNELLS—See Hydraulic Oil Storage & Engineering Co.

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

STOVER Steel Tank & Mfg. Co., Hancock Ave., Freeport, Ill.

TAYLOR Mfg. Co., Montclair, N. J.

TIRRILL Gas Machine Lighting Co., 103 Park Ave., New York, N. Y.

TOKHEIM Mfg. Co., 815 N. First St., W., Cedar Rapids, Ia. "Acro," "Hawkeye."

TRAHERN Pump Co., 707 S. Main St., Rockford, Ill.

U. S. Gas Machine Co., Ninth St. & Clay Ave., Muskegon, Mich.

UNIVERSAL Iron & Supply Co., St. Louis, Mo.
(See page 515.)

VAC Liquid Equipment Co., 1125 C. Ave., W., Cedar Rapids, Ia.

WAYNE Oil Tank & Pump Co., 16 Canal St., Fort Wayne, Ind.
(See page 513.)

WELDED Steel Barrel Corp., Hart & Charlervoix Sts., Detroit, Mich.

WELDEX Mfg. Co., 12th & N. E. Sts., Richmond, Ind.

WESTERN Oil Pump & Tank Co., 2437 Kosciusko St., St. Louis, Mo. "Little Sampson," "Imperial," "Perfection," "Little Gem," "Big Gusher," "Mogul."

OXYGEN TANKS

BURDETT Oxygen Co., 1401-05 Jackson Blvd., Chicago, Ill.

LINDE Air Products Co., 42d St. Bldg., New York, N. Y.

SUPERIOR Oxygen Co. of Mo., 115 Plum St., St. Louis, Mo.

TARIFFVILLE Oxygen & Chemical Co., Tariffville, Conn.

TIRE INFLATING TANKS

BISHOP-BABCOCK-BECKER Co., E. 49th St. & Hamilton Ave., Cleveland, O.

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.

LIQUID Carbonic Co., 3100 S. Kedzie Ave., Chicago, Ill.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind.

TIRE TESTING TANKS

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

HACO—See Heller-Aller Co.

HELLER-ALLER Co., Napoleon, O. "Haco."

VACUUM GASOLINE TANKS

CARTER Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

STEWART-WARNER Speedometer Corp., Chicago, Ill.
(See page 461.)

TAPE

INSULATING AND TIRE TAPE

BESTYET—See St. Louis Rubber Cement Co.

BLACK DIAMOND—See Dunton Co.

BOSTON Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass. "Evergrip."

CLIFTON Mfg. Co., 65 Brookside Ave. (Jamaica Plain), Boston, Mass.

DUNTON Co., M. W., 150-52 Niagara St., Providence, R. I. "Black Diamond."

EVERGRIP—See Boston Woven Hose & Rubber Co.

GOODRICH Co., B. F., Akron, O.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind.
(See page 523.)

J-M—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M."

KERITE Insulated Wire & Cable Co., 30 Church St., New York, N. Y.

MANSON—See Okonite Co.

NEW York Insulated Wire Co., 114 Liberty St., New York, N. Y.

OKONITE Co., 253 Broadway, New York, N. Y. "Manson."

PACKARD Electric Co., Warren, O.

RUSSELL Mfg. Co., Middletown, Conn.
(See page 811.)

ST. LOUIS Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "Bestyet."

UNITED States Tire Co., Broadway & 53th St., New York, N. Y.

VAN Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

VULTITE Rubber Co., Bridgeport, Conn.
(See page 797.)

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

TAXIMETERS

AMERICAN Taximeter Co., Broadway & 57th St., New York, N. Y. "Popp," "Jones."

INTERNATIONAL Taxameter Co. of America, 239 W. 68th St., New York, N. Y.

JONES—See American Taximeter Co.

PITTSBURGH Taximeter Co., Centre & Negley Aves., Pittsburg, Pa.

POPP—See American Taximeter Co.

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(See Fittings, Pipe)

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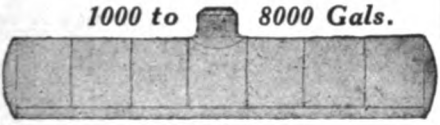

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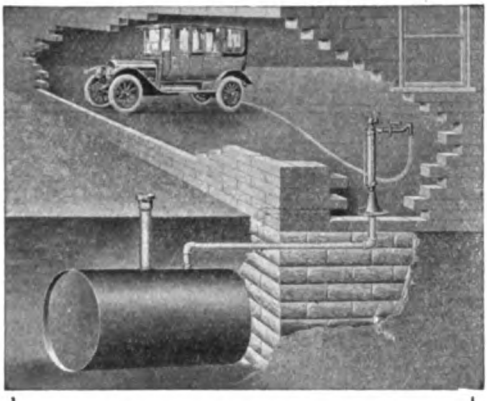

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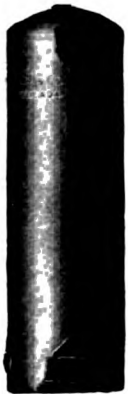

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LIMOUSINE TELEPHONES

(For Speaking Tubes—See Tubes, Speaking; For Annunciators—See Annunciators)

AMERICAN Electric Co., State & 64th Sts., Chicago, Ill. "Carphone."

CARPHONE—See American Electric Co.

CHAU-PHONE—See Western Electric Co.

GOHRING—See Taylor Co.

MENOMINEE Electric Mfg. Co., Menominee, Mich.

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y.
(See page 223.)

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y. "Gohring."

WESTERN Electric Co., 463 West St., New York, N. Y. "Chau-Phone."
(See page 517.)

TENTS

TOURING TENTS

ALL-IN-ONE—See Warner Auto Top Co.

AUTO Bed Co., Bellingham, Wash.

CLEVELAND-AKRON Bag Co., E. 40th St., & Perkins Ave., Cleveland, O.

COMPAC Tent Co., 425 W. Tenth St., Indianapolis, Ind.

COUCH Bros. Mfg. Co., Cincinnati, O.

DE BRETTEVILLE, Gustav, Claus Spreckles Bldg., San Francisco, Cal.

DES MOINES Tent & Awning Co., 905 Walnut St., Des Moines, Ia.

ENTERPRISE Bed Co., Hammond, Ind.

PORTABLE Camp Co., 938 Woodward Ave., Detroit, Mich.

STRONG Bungalow Co., Hartford, Conn.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O. "All-in-One."
(See page 211.)

TERMINALS

WIRE TERMINALS

(See also Connectors, Battery)

BARCY-NICHOLSON Co., 841-43 Fort St., W., Detroit, Mich.

BECCO—See Michigan Motor Specialties Co.

BLAUVELT Co., James P., Cedar St., Nyack, N. Y.

BLISS-CHESTER Co., Providence, R. I. "Duplex."
(See page 517.)

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

BREAZNELL, J. H., 26 Court St., Brooklyn, N. Y.

CHAMPION Spark Plug Co., 1014 Upton Ave., Toledo, O. "J-D."
(See pages 385 to 388.)

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

DUPLEX—See Bliss-Chester Co.

E. G.—See Grossman Mfg. Co.

ELK Mfg. Co., 1926 Broadway, New York, N. Y.

EUREKA—See Morse, Frank W.

EVERETT Mfg. Co., 162-64 N. May St., Chicago, Ill.

FAHNESTOCK Electric Co., 129 Patchen Ave., Brooklyn, N. Y.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn.
(See page 685.)

GOODSON—See Graham Mfg. Co.

GRAHAM Mfg. Co., 94 Point St., Providence, R. I. "Goodson."

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HERZ & Co., 245 W. 55th St., New York, N. Y.
(See page 389.)

HI-PO Waterproof Battery Co., 1007 Atlantic Ave., Brooklyn, N. Y.

J-D—See Champion Spark Plug Co.

LOMBARDI Motor Car Co., 67-71 Minerva St., Derby, Conn.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

MORSE, Frank W., 293 Congress St., Boston, Mass. "Eureka."
(See page 517.)

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

PITTSFIELD Spark Coil Co., Pittsfield, Mass.
(See page 169.)

RAJAH Auto-Supply Co., Bloomfield, N. J.
(See page 393.)

SHAIN, Chas. D., Brooklyn, N. Y.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich.

TESTERS

BATTERY TESTERS

(See Hydrometers)

ACID TESTERS

(See Gauges, Battery)

GASOLINE TESTERS

(See Hydrometers)

THERMOMETERS

VULCANIZER THERMOMETERS

QUEEN-GRAY Co., 616-18 Chestnut St., Philadelphia, Pa.

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THERMOMETERS
(Continued)
VULCANIZER THERMOMETERS
(Continued)

STANDARD Thermometer Co., 65 Shirley St., Boston, Mass.
(See page 639.)

TAYLOR Instrument Cos., 95 Ames St., Rochester, N. Y.

WEINHAGEN, H., 159-65 Leonard St., New York, N. Y.

WILSON & Wilson (Waverly Sta.), Boston, Mass.

THREAD

TOP AND UPHOLSTERY THREAD

AMERICAN Thread Co., 260 W. Broadway, New York, N. Y.

COLUMBIA—See Meyer & Co.

CRESCENT—See Meyer & Co.

HUB—See Meyer & Co.

MEYER & Co., John C., Lowell, Mass. "Hub," "Crescent," "Columbia," "Rugby."

RUGBY—See Meyer & Co.

SUMMIT Thread Co., Summit St., East Hampton, Conn.

TIMERS

IGNITION OR SPARK TIMERS

(See also Systems, Single Spark Ignition)

ALMY Water Tube Boiler Co., ft. Rhoades St., Providence, R. I.

AMERICAN Electric Co., State & 64th Sts., Chicago, Ill. "Samson."

AMPCO—See S-M Novelty Mfg. Co.

BENFORD Mfg. Co., Box H., Mt. Vernon, N. Y. "Monarch."
(See page 695.)

BLITZ—See Electrical Specialty Mfg. Co.

CAPITOL Tool & Die Works, 1100 Oakdale Ave., Chicago, Ill. "Star."

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

CUNO Engineering Corp., 80 S. Vine St., Meriden, Conn.

ELECTRICAL Specialties Mfg. Co., 1125 N. 22d St., Omaha, Neb. "Blitz," "Intensifire."

GAS Engine Supply Co., 784 Main St., Meadville, Pa. "Little Gem."

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco."
(See page 675.)

HERZ & Co., 245 W 55th St., New York, N. Y.
(See page 389.)

INTENSIFIRE — See Electrical Specialties Mfg. Co.

INTER-STATE Machine Co., Rochester, N. Y. "Leavitt." "Uncas."

KLAHN—See Mosler & Co.

LEAVITT—See Inter-State Machine Co.

LEHMAN Mfg. Co., J. H., 727 Seventh Ave., New York, N. Y.

LITTLE GEM—See Gas Engine Supply Co.

LONG Bros., Broadway & Buckeye St., Kokomo, Ind.

LUNDGREN Mfg. Co., Hale Bldg., Philadelphia, Pa.

MILWAUKEE Auto Engine & Supply Co., 29th St. & Mieneke Ave., Milwaukee, Wis.

MONARCH—See Benford Mfg. Co.

MOSLER & Co., A. R., Mt. Vernon, N. Y. "Klahn," "Umph."

NEW York Coil Co., 338-40 Pearl St., New York, N. Y. "Rhoades."

PITTSFIELD Spark Coil Co., Pittsfield, Mass.
(See page 169.)

RHOADES—See New York Coil Co.

S-M Novelty Mfg. Co., 52d St. & Baltimore Ave., Philadelphia, Pa. "Ampco."

SAMSON—See American Electric Co.

SINTZ—See Wilmarth & Morman Co.

SPLITDORF Electrical Co., Newark, N. J.

STAR—See Capitol Tool & Die Works.

TRIO Mfg. Co., 1192-1206 Bellevue Ave., Detroit, Mich.

UMPH—See Mosler & Co.

UNCAS—See Inter-State Machine Co.

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WILMARTH & Morman Co., 1179 Monroe Ave., N. W., Grand Rapids, Mich. "Sintz."

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RACINE Auto Tire Co., 200 Clark St., Racine, Wis. "Horseshoe."

PNEUMATIC TIRES

(See also Tubes, Inner)

ACME Rubber Mfg. Co., Trenton, N. J.

ADVANCE Rubber Co., 18th St. & Eighth Ave., Brooklyn, N. Y.

AJAX-GRIEB Rubber Co., 1796-98 Broadway, New York, N. Y.

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PNEUMATIC TIRES (Continued)

ALLIANCE Rubber Co., Alliance, O. (See page 845.)

BATAVIA Rubber Co., Batavia, N. Y.

BOWERS Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

BRAENDER Rubber & Tire Co., Rutherford, N. J. "Bull Dog." (See page 551.)

BRUNSWICK-BALKE-COLLENDER Co., 623 S. Wabash Ave., Chicago, Ill.

BUCKSKIN—See L. & M. Rubber Co.

BUCYRUS Rubber Co., Bucyrus, O.

BULL—See Kansas City Tire & Rubber Corp.

BULL DOG—See Braender Rubber & Tire Co.

CALIFORNIA—See Hendrie Rubber Co.

CANVAS Tread Tire Co., 69 Genesee St., Utica, N. Y.

CAPITOL—See National Tire & Rubber Co.

CARSPRING—See New Jersey Car Spring & Rubber Co.

CENTAUR Rubber & Tire Co., 940-42 Second St., Gallipolis, O.

CENTURY—See Rubber Insulated Metals Corp.

CHESTER—See Kansas City Tire & Rubber Co.

CLEVELAND—See Standard Tire & Rubber Mfg. Co.

COLUMB Tyres Import Co., 1891 Broadway, New York, N. Y. (Importers.) "Prowodnik," "Faure."

COLUMBIANA Tire & Rubber Co., Columbiana, O.

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

CONGRESS—See McGraw Tire & Rubber Co.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic." (See page 685.)

CONVERSE Rubber Shoe Co., Malden, Mass. "Tuff-E-Nuff."

CORTLAND Tire & Rubber Co., 342 Cortland St., Belleville, N. J.

DAYTON Rubber Mfg. Co., 2346 Kiser St., Dayton, O. (See page 533.)

DELION Tire & Rubber Co., 1791 Broadway, New York, N. Y. (See page 845.)

DIXIE—See Dreadnaught Tire & Rubber Co.

DOUBLE Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.

DREADNAUGHT Tire & Rubber Co., Munsey Bldg., Baltimore, Md. "Dixie."

DRY Climate Tire Mfg. Co., Arvada, Colo.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

FALLS Rubber Co., Cuyahoga Falls, O. "Greyhound."

FAURE—See Columb Tyres Import Co.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

FIRESTONE Tire & Rubber Co., Akron, O.

FISK Rubber Co., Chicopee Falls, Mass.

GAULOIS Tire Corp., 49 W. 64th St., New York, N. Y. (Importers.)

GENERAL Tire & Rubber Co., Akron, O. (See page 531.)

GLOBE Rubber Tire Mfg. Co., Trenton, N. J.

GOODRICH Co., B. F., Akron, O. "Silvertown."

GOODYEAR Tire & Rubber Co., Akron, O.

GORDON Tire & Rubber Co., Canton, O. "Ideal."

GREYHOUND—See Falls Rubber Co.

HARDMAN Tire & Rubber Co., Belleville, N. J. (See page 793.)

HENDRIE Rubber Co., W. C., Torrance, Cal. "California."

HIGHWAY—See National Tire & Rubber Co.

HOOD Rubber Co., Watertown, Mass. (See page 533.)

HORSESHOE—See Racine Auto Tire Co.

IDEAL—See Gordon Tire & Rubber Co.

IMPERIAL—See McGraw Tire & Rubber Co.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind. (See page 523.)

KANSAS City Tire & Rubber Corp., Kansas City, Mo. "Bull," "Chester," "Travler."

KEATON Tire & Rubber Co., 616-24 Van Ness Ave., San Francisco, Cal.

KELLY-SPRINGFIELD Tire Co., 229 W. 57th St., New York, N. Y.

KEYSTONE Rubber Mfg. Co., Erie, Pa. (See page 521.)

KNIGHT Tire & Rubber Co., Canton, O.

KOKOMO Rubber Co., Kokomo, Ind.

L. & M. Rubber Co., Carrollton, O.

LANCASTER Tire & Rubber Co., Lancaster, O. "Wiregrip."

LEE Tire & Rubber Co., Conshohocken, Pa.

McCLEARY Tire & Rubber Co., 15th & School Sts., Indiana, Pa.

McCLURG Rubber Co., Coshocton, O.

McGRAW Tire & Rubber Co., East Palestine, O. "Imperial," "Congress," "Pullman." (See page 521.)

MANSFIELD Tire & Rubber Co., Newman St., Mansfield, O.

MARATHON Tire & Rubber Co., Cuyahoga Falls, O. (See page 533.)

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MICHELIN Tire Co., Milltown, N. J. (See Inside Back Cover.)

MILLER Rubber Co., Akron, O.

MOHAWK Rubber Co., Second & River Sts., Akron, O.

NASSAU—See Thermoid Rubber Co.

NATIONAL Rubber Co., Pottstown, Pa. (See page 535.)

NATIONAL Tire & Rubber Co., East Palestine, O. "Capitol," "Highway." (See page 535.)

NEEDHAM Tire Co., Charles River, Mass.

NEW Castle Rubber Co., New Castle, Pa.

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J. "Carspring."

NORWALK Tire & Rubber Co., Norwalk, Conn.

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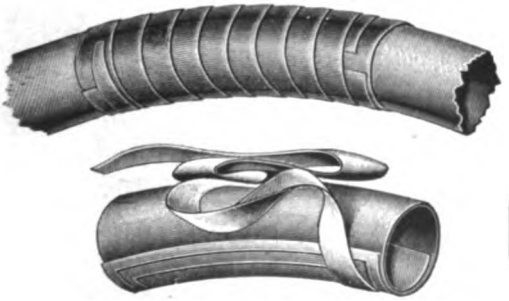

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TIRES (Continued)

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O. K.—See Oliver Rubber Mfg. Co.

OHIO Tire Co., Mansfield, O.

OLIVER Rubber Mfg. Co., 2203 Broadway, Oakland, Cal. "O. K."

PACKARD—See Pharis Tire & Rubber Co.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

PERFECTION Tire & Rubber Co., Marquette Bldg., Chicago, Ill.

PHARIS Tire & Rubber Co., Newark, O. "Packard."
(See page 833.)

PORTAGE Rubber Co., Barberton, O.

PORTER Rubber Co., Salem, O.

PROWODNIK—See Columb Tyres Import Co.

PULLMAN—See McGraw Tire & Rubber Co.

QUAKER City Rubber Co., Philadelphia, Pa.
(See page 839.)

RACINE Auto Tire Co., 200 Clark St., Racine, Wis. "Horseshoe."

RACINE Rubber Co., Racine, Wis.
(See page 525.)

REPUBLIC Rubber Co., Youngstown, O.

RUBBER Insulated Metals Corp., Plainfield, N. J. "Century."

RUBBER Products Co., Barberton, O. "Stronghold."
(See page 811.)

RUTHERFORD Rubber Co., Rutherford, N. J. "Sterling."

SAVAGE Tire Co., Main & Sicord Sts., San Diego, Cal.

SEAMLESS Rubber Co., 584 Congress Ave., New Haven, Conn.

SILVERTOWN—See Goodrich Co.

STANDARD Tire & Rubber Mfg. Co., Hippodrome Bldg., Cleveland, O. "Cleveland."
(See page 519.)

STERLING—See Rutherford Rubber Co.

STRONGHOLD—See Rubber Products Co.

SWINEHART Tire & Rubber Co., Akron, O.
(See page 825.)

TEN Broeck Tyre Co., 840 S. 26th St., Louisville, Ky.

THERMOID Rubber Co., Trenton, N. J. "Nassau."
(See pages 81 and 289.)

TOLEDO-FINDLAY Tire & Rubber Co., Western Ave., Findlay, O.

TRAVLER—See Kansas City Tire & Rubber Corp.

TUFF-E-NUFF—See Converse Rubber Shoe Co.

TYER Rubber Co., Andover, Mass. "Tyrian."

TYRIAN—See Tyer Rubber Co.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

VICTOR Rubber Co., Springfield, O.
(See page 529.)

VITALIC—See Continental Rubber Works.

VULCANIZED Products Co., Muskegon, Mich.

WILSON TIRE & RUBBER CO., Springfield, Ill.
(See page 857.)

WIREGRIP—See Lancaster Tire & Rubber Co.

ZEE Zee Tire & Rubber Co., 33d & Walnut Sts., Philadelphia, Pa.

SOLID TIRES

BUCYRUS Rubber Co., Bucyrus, O.

FIRESTONE Tire & Rubber Co., Akron, O.

GAULOIS Tire Corp., 49 W. 64th St., New York, N. Y. (Importers.)

GIBNEY Tire & Rubber Co., Conshohocken, Pa.

GOODYEAR Tire & Rubber Co., Akron, O.

HOOD Rubber Co., Watertown, Mass.
(See page 533.)

KELLY-SPRINGFIELD Tire Co., 229 W. 57th St., New York, N. Y.

McGRAW Tire & Rubber Co., East Palestine, O.
(See page 521.)

MILFORD Rubber Works, Milford, Ill.

POLACK Tyre & Rubber Co., 1876 Broadway, New York, N. Y.

REPUBLIC Rubber Co., Youngstown, O.

SIMPLEX Rubber Co. of America, Quimby St., Ossining, N. Y.

SWINEHART Tire & Rubber Co., Akron, O.
(See page 825.)

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

VICTOR Rubber Co., Springfield, O.
(See page 529.)

VULCAN Rubber Co., Ninth & State Sts., Erie, Pa. "Vulco."

VULCO—See Vulcan Rubber Co.

SPECIAL TIRES

AMERICAN Spring Tire Co., 118 N. La Salle St., Chicago, Ill.

AMERICAN Wood Tire Co., 1631 Monadnock Blk., Chicago, Ill.

CARHART Laminated Tire Co., Moore Bldg., San Antonio, Tex.

DAYTON Rubber Mfg. Co., 2346 Kiser St., Dayton, O.
(See page 533.)

FAVARY Tire Co., 30 E. 42d St., New York, N. Y.

FEAR-NAUGHT Tire & Rubber Co., Romaine Bldg., Paterson, N. J.

GOODYEAR Tire & Rubber Co., Akron, O. "Motz."

KING—See Punctureless Auto Tire Co.

LEATHER Tire Goods Co., Niagara Falls, N. Y.
(See pages 82 and 83.)

LEE Tire & Rubber Co., Conshohocken, Pa.

McNAULL Tire Co., Toledo, O.
(See page 861.)

MODERN Railway Appliance Co., 981 Broadway, Albany, N. Y. "Simmons."

MOLLITOR Tire Co., 4241 Irving Park Blvd., Chicago, Ill.

MOTZ—See Goodyear Tire & Rubber Co.

Complete Index to Classification appears on Pages 8 to 27.

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INDIANA TIRES

INNER TUBES

INNER LINERS

OUTER BOOTS

INNER SLEEVES

BLOW-OUT PATCHES

CEMENTLESS PATCHES

CEMENT PATCHES

The Product of a State

Pride of a Nation

Indiana Rubber & Insulated Wire Company

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Jonesboro, Ind.

Chicago Office
210 So. Desplaines St.

Eastern Representative
George R. Hall
West Hartford, Conn.

Western Representative
K. Franklin Peterson
122 So. Michigan Ave., Chicago, Ill.

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TIRES (Continued)

SPECIAL TIRES (Continued)

PICKETT, L. E., 6015 Michigan Ave., St. Louis, Mo.

PUNCTURELESS Auto Tire Co., Akron, O. "King."

SIMMONS—See Modern Railway Appliance Co.

STEEL Cushion Tire Co., 1 W. 34th St., New York, N. Y.

SWINEHART Tire & Rubber Co., Akron, O.
(See page 825.)

TENSION Tire Co., Land Title Bldg., York, Pa.

TRAUTMAN'S Air-Rubber Tube Co., 129 Sixth Ave., Brooklyn, N. Y.

UNION Sales Co., Harrisburg, Pa.
(See page 863.)

WILSON Tire & Rubber Co., Springfield, Ill.
(See page 857.)

TOOLS

CHAIN REPAIR TOOLS

BROWN & Son, J. C., Butler, Ind.

HANDEE—See Racine Handy Mfg. Co.

HARRIS & Reed Mfg. Co., 1500-22 W. 15th St., Chicago, Ill.

MACQUIC—See Macdonald & Co.

NECESSITY—See Macdonald & Co.

MACDONALD & Co., J. N. Wethersfield, Conn. "Necessity." "Macquic."

RACINE Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."
(See page 621.)

DEMOUNTABLE RIM CONTRACTING TOOLS

CROXFORD Auto Rim Tool Co., Malden, Mass.
(See page 667.)

FRIESTEDT Rim Contractor Co., 2928-32 W. Lake St., Chicago, Ill.

HOOF & Co., John C., 38 S. Dearborn St., Chicago, Ill.

K. P. Mfg. Co., 250 W. 54th St., New York, N. Y.

McLAIN, Victor C., 820 E. 19th St., East Moline, Ill.

NISWANDER Mfg. Co., Quincy, Ill.

SCHULTZE Machine Shop, Green & Lincoln Sts., Chenoa, Ill.

STANDARD Welding Co., Cleveland, O. "Stanweld."
(See Book Mark.)

STANWELD—See Standard Welding Co.

TOLEDO Auto Tool Co., Toledo, O.

WEISER'S E. Z. Rim Tool Co., 433-35 High St., Hamilton, O.
(See page 673.)

ELECTRO MAGNETIC LIFTING TOOLS

(For lifting bolts, nuts, etc., from cylinders, gear case pans, etc.)

J & B Mfg. Co., Pittsfield, Mass.
(See page 613.)

PISTON RING REMOVING TOOLS

EMPIRE—See S. B. R. Specialty Co.

MORGAN Mfg. Co., John St., Newport, R. I.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Empire."

WILHELM-SMITH Machine Co., 926 Bingaman St., Reading, Pa.

SPRING LEAF SEPARATING TOOLS

(For separating the spring leaves so they may be lubricated)

BUCKEYE—See Central Brass & Fixture Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

CINCINNATI Tool Co., 1951 Waverly Ave., Norwood, O.

COCHRAN Pipe Wrench Mfg. Co., 7544 S. Chicago Ave., Chicago, Ill.

DACO—See Danver Accessory Co.

DANVER Accessory Co., Pawtucket, R. I. "Daco."

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HALLADAY Co., L. P., Streator, Ill.

KNOWLSONS—See Spring Leaf Lubricator Co.

MANZEL Co., Chas. W., 309 Beard Ave., Buffalo, N. Y. "Tomahawk."

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NORTON—See Spencer's Sons.
R. & L. Spring Spreader Co., Anderson, Ind.

SPENCER'S Sons, I. S., Guilford, Conn. "Norton."

SPRING Leaf Lubricator Co., Ann Arbor, Mich. "Knowlsons."
(See page 665.)

STANDARD Engineering Works, 59 Social St., Woonsocket, R. I.

TOMAHAWK—See Manzel Co.

VLCHEK Tool Co., 10709 Quincy Ave., Cleveland, O.

TIRE CHAIN ATTACHING TOOLS

ALCEMO Mfg. Co., 5 Bridge St., Newark, N. J.

BUFFUM Tool Co., Louisiana, Mo.

FOSTER Bros. Mfg. Co., 811 Broad St., Utica, N. Y.

GEIER Co., P. A., 5112 St. Clair Ave., E., Cleveland, O.

TIRE CHAIN REPAIR TOOLS

BUFFUM Tool Co., Louisiana, Mo.

McKAIG Drop Forge Co., 14 Perry St., Buffalo, N. Y.

S. M. H. Mfg. Co., Pittsburgh, Pa.

SHELLEY Tool Co., Saranac Lake, N. Y.

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RACINE TIRES

Plain Tread
3,500 Mile
Guarantee

Country Road
5,000 Mile
Guarantee

Trusty Tread
5,000 Mile
Guarantee

Above are the *only* styles of Treads

Manufactured by the

RACINE RUBBER COMPANY

RACINE, WIS.

DEALERS—Racine Distributors carry a large stock of tires ready for immediate shipment. Some desirable territory still open for local agents. For details address factory direct.

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TOOLS (Continued)

TIRE DEFLATING TOOLS

DUPLEX Machine Co., 136 N. Erie St., Toledo, O.

SPRICK Bros. Investment Co., Stickney, S. Dak.

TIRE TOOLS

(For taking off and putting on tires)

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

BECCO—See Michigan Motor Specialties Co.

BRIDGEPORT Hardware Mfg. Corp., Bridgeport, Conn.

CALNAN Tire Remover Co., West Upton, Mass.

CARLSON & Co., Charles G., 3725 Wall St., Chicago, Ill. "Star."

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Springfield."

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

ECLIPSE—See Shawver Co.

EMBREY & Co., H. L., 5840 Prairie Ave., Chicago, Ill.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HOOVER Co., W. H., New Berlin, O.

J. P. Tire Tool Co., York, Neb.

L. & M.—See Long Machine Works.

LONG Machine Works, Adam A., Ave. E & St. Paul St., Rochester, N. Y. "L. & M."

McPHERSON Bros., 11 Bank St., Le Roy, N. Y. "Oatka."

MAGIC—See Max Machine Co.

MASON Auto Clincher Tire Remover & Replacer Co., 122-24 Broadway, Paducah, Ky.

MAX Machine Co., Clinton, Mass. "Magic."

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

MORGAN Mfg. Co., John St., Newport, R. I.

NATIONAL Jack & Mfg. Co., 130-32 S. Clinton St., Chicago, Ill.

NELSON, A. A., Warrenton, Va.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

OATKA—See McPherson Bros.

OFF-AN-ON—See Stewart Accessories Co.

PERFECT—See Pratt Mfg. Co.

PERFECT HANDLE—See Smith & Co.

PERFECTION Mfg. Co., New Martinsville, W. Va.

PRATT Mfg. Co., Wm. E., 85 W. Lake St., Chicago, Ill. "Perfect."

RHODES Mfg. Co., S. Division St. & First Ave., Grand Rapids, Mich.

RUDOLF Tire Tool Co., 1007 James St., N. S., Pittsburg, Pa.

SHAWVER Co., rear 31 W. Pleasant St., Springfield, O. "Springfield," "Eclipse."

SMITH & Co., H. D., Plantsville, Conn. "Perfect Handle."

SPRINGFIELD—See Central Brass & Fixture Co.

SPRINGFIELD—See Shawver Co.

STAR—See Carlson & Co.

STEWART Accessories Co., 820 W. Warren Ave., Detroit, Mich. "Off-An-On."

TOBEY, Wm. L., 9 Lewis St. (E. Boston), Boston, Mass.

U-SAV-YOUR Mfg. Co., 51 Perkins St., Warren, Mass.

UNIVERSAL Auto-Tire Remover Co., 948 Market St., San Francisco, Cal.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis.

TIRE VALVE RETHREADING TOOLS

HANSON, Henry L., 26 Union St., Worcester, Mass.

HERCULES—See Wells & Son Co.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

SCHRADER'S Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y.
(See page 255.)

UTILITY—See Wells & Son Co.

WELLS & Son Co., F. E., 45 Ridell St., Greenfield, Mass. "Hercules," "Utility."

VALVE GRINDING TOOLS

(For Valve Grinding Machines—See Machines, Valve Seating)

ALBERTSON & Co., 110-14 Jennings St., Sioux City, Ia.

ASHCROFT Mfg. Co., 119 W. 40th St., New York, N. Y.

BALDWIN—See Universal Valve Grinder Co.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CURKO—See Currier-Koeth Mfg. Co.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "Curko."

FLEXIBLE Valve Remover Co., 110 W. Exchange St., Providence, R. I.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GOODELL-PRATT Co., Greenfield, Mass.

HEALY Tool & Appliance Co., 62-64 Pearl St., Buffalo, N. Y.

IDEAL Valve Grinder Co., 1478 W. 22d St., Los Angeles, Cal.

KELLOGG Mfg. Co., Rochester, N. Y.
(See page 413.)

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YOU—and thousands of others have been waiting for years for

RUSTICENE

the wonderful new secret process for

removing rust and **taking apart rusted fittings**

FOR AUTOMOBILES

What it is: RUSTICENE is a fluid absolutely free from acids, and will not injure the basic metal in any way.

What it does: A **Few Drops** of RUSTICENE

Removes rusted nuts from Running Board Bolts, Retaining Nuts from Radius Rod Bushings, Spring Clip Bolts, Spring Shackle Bolts, Muffler Connections; removes Brake Pins, Cotter Pins; disconnects Brake Bars, Brake Connections; loosens Emergency and Foot Brakes, etc., removes all rust and adds life to Springs, Tortion Tubes, etc., etc.

Each gallon of RUSTICENE, if properly applied, will save from one hundred to one hundred and fifty dollars in labor and materials.

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Mail or Telephone Orders promptly taken care of.

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W. P. McKINNEY, *General Manager*

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The Little Wonder

Vaporizing Valve?

They do
Because

In a dynamometer test for horsepower and fuel consumption conducted under the auspices and by a representative of the Automobile Association of America, together with a representative of the Zenith Carburetor Mfg. Co.

THE LITTLE WONDER VALVE

showed a saving of 37 5/10% on a four cylinder engine, 41 8/10% on a six cylinder engine and 42 2/10% on an eight cylinder engine, with an increase in power ranging from 18 to 34%.

It retails for $5 with a positive money back guarantee.

Send in your order now and start making sales.

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The cost is moderate—the effectiveness is great—

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243-249 W. 39th St., New York

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TOOLS (Continued)

VALVE GRINDING TOOLS (Continued)

KNIGHT Co., David Whitney Bldg., Detroit, Mich.

LAMB Mfg. Co., Winsted, Conn.

MALLEABLE Iron Fittings Co., Branford, Conn. "Mifco."

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O. (See page 775.)

MERRY, Edward, 395 Allen St., Springfield, Mass.

MIFCO—See Malleable Iron Fittings Co.

MISCH—See Motch & Merryweather Machinery Co.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

MOTCH & Merryweather Machinery Co., 707 Lakeside Ave., N. W., Cleveland, O. "Misch."

OWEN—See Stewart & Co.

PERFECT—See Smith Machine Works.

PERFECT—See Stahl Mfg. Co.

ROTHERMICH, A. P., 2915 N. Taylor Ave., St. Louis, Mo.

SIMPLICITY—See Universal Equipment & Supply Co.

SMITH Machine Works, Winton L., Newark, N. J. "Perfect."

STAHL Mfg. Co., 983 17th Ave., S. E., Minneapolis, Minn. "Perfect."

STEWART & Co., 171 Broadway, New York, N. Y. "Owen."

TURKO—See Turnbull Mfg. Co.

TURNBULL Mfg. Co., Wilmington, O. "Turko."

UNIVERSAL Equipment & Supply Co., 325 W. Fayette St., Syracuse, N. Y. "Simplicity."

UNIVERSAL Valve Grinder Co., Almond, Wis. "Baldwin."

WALL, J. H., 290 Hope St., Bristol, R. I.

VALVE SEATING OR FACING TOOLS

AMERICAN Valve Tool Co., 589 Hudson St., New York, N. Y.

BEAN Co., Berea, O.

BRAUNSDORF-MUELLER CO., Elizabeth, N. J.

CRONE, F. G., 334 Genesee St., Buffalo, N. Y.

CURKO—See Currier-Koeth Mfg. Co.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "Curko."

FOSNACHT—See Parcrid Motor Appliance Co.

G. B. Garage & Mfg. Co., 299 Franklin St., Hempstead, N. Y.

HEALY Tool & Appliance Co., 62-64 Pearl St., Buffalo, N. Y.

HUGHES, Bull Co., 1038 Hancock Ave., W Detroit, Mich. "Use-Bull."

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

PARCRID Motor Appliance Co., 30 N. Michigan Blvd., Chicago, Ill. "Fosnacht."

SARGENT, James M., Graniteville, Mass.

USE-BULL—See Hughes, Bull Co.

VALVE SPRING LIFTING TOOLS

AUBURN Ignition Mfg. Co., Auburn, N. Y. (See page 451.)

AUTO Forge Sales Co., 80 King Ave., Columbus, O.

BUFFUM Tool Co., Louisiana, Mo.

C. P.—See Clinton Machine Works.

CLINTON Machine Works, 460 High St., Clinton, Mass. "C. P."

CURKO—See Currier-Koeth Mfg. Co.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "Curko."

E-Z—See Syracuse Wrench Co.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

FLEXIBLE Valve Remover Co., 110 W. Exchange St., Providence, R. I.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

HALLBAUER Lifter Co., 1537 Wellston Ave. (Wellston), St. Louis, Mo.

HALLGREN, Carl, 682 Summit Ave., Pasadena, Cal.

HEALY Tool & Appliance Co., 62-64 Pearl St., Buffalo, N. Y.

HOADLEY, F. B., 479 Willow St., Waterbury, Conn.

HUBBARD, R. L., 4 Gouverneur St., Newark, N. J.

ILLINOIS—See Parcrid Motor Appliance Co.

KING Specialty Mfg. Co., 200 Washington St., Brookline, Mass. (See page 599.)

KRAEMER—See United States Compass Co.

MECHANICAL & Electrical Mfg. Co., 2225 Prairie Ave., Chicago, Ill. "Triumph."

MERTZ Co., H. B., 1408 Rutherford Ave., Pittsburg, Pa.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium."

MORGAN Mfg. Co., John St., Newport, R. I. "Utility."

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo. (See page 747.)

NATIONAL Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

NOONAN Tool & Machine Works, A. S., 130-36 St. James St., Rome, N. Y.

PARCRID Motor Appliance Co., 30 N. Michigan Blvd., Chicago, Ill. "Illinois."

PERFECT—See Smith Machine Works.

PERFECT HANDLE—See Smith & Co.

RADIUM—See Milwaukee Auto Specialty Co.

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The Victor
Springfield

Auto Tires and Tubes

The Victor Tire is hand built of highest quality materials possible to obtain.

The extra value built into Victor Tires is multiplied in service to the user.

An unusually pleasing appearance emphasizes the tire's high quality and attracts the admiration of the buyer.

Dealers write us for our protection proposition.

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Casing	N.S.	Red Tube	Grey Tube
30x3	$14.25	$2.95	$2.70
30x3½	18.10	3.80	3.35
32x3½	20.85	4.10	3.50
33x4	28.95	5.05	4.50
34x4	29.55	5.20	4.65
36x4½	41.65	6.85	6.15
37x5	51.50	8.10	7.30

Made in all popular sizes. Plain Tread and Non Skid. Straight Side, Q. D. Clincher and Clincher Types.

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5000 Miles

On Non-Skid and

4000 on Plain Treads

THE MOST COMPLETE LINE

Includes Casings, Tubes, Truck Tires, Auto Mats, Matting, Carriage Tire.

HIGHEST QUALITY
MODERATE PRICES
LIBERAL GUARANTEE

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Victor Rubber Company

Springfield, Ohio

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TOOLS (Continued)

VALVE SPRING LIFTING TOOLS (Continued)

SJOHOLM, N. P., 11 Westmoreland Pl., St. Louis, Mo.

SMITH Machine Works, Winton L., Newark, N. J. "Perfect."

SMITH & Co., H. D., Plantsville, Conn. "Perfect Handle."

SYRACUSE Wrench Co., Syracuse, N. Y. "E-Z."
(See page 765.)

TRIUMPH—See Mechanical & Electrical Mfg. Co.

TURKO—See Turnbull Mfg. Co.

TURNBULL Mfg. Co., Wilmington, O. "Turko."

UNITED States Compass Co., Cedarburg, Wis. "Kraemer."

UTILITY—See Morgan Mfg. Co.

VLCHEK Tool Co., 10709 Quincy Ave., Cleveland, O.

TOPS

AUTOMOBILE TOPS

A-W—See Adams-Williams Mfg. Corp.

ACME Auto Top Co., 1421 Irving St., Washington, D. C.

ADAMS-WILLIAMS Mfg. Corp., 1790 Broadway, New York, N. Y. "A-W."

AMERICAN Auto Top Mfg. Co., 1451-53 Washington Blvd., Chicago, Ill.

AMERICAN Auto Trimming Co., 669 Mack Ave., Detroit, Mich.

AMERICAN Top Co., Jackson, Mich.

AMESBURY Top Co., Cedar St., Amesbury, Mass.

ANCHOR Buggy Co., Cincinnati, O.

APPLE Motor Car Co., W. A., 343 Cincinnati St., Dayton, O.

ATLANTA Automobile Top & Trimming Co., 755-57 Whitehall St., Atlanta, Ga.

AUTO Cape Top Co., 2334 Michigan Ave., Chicago, Ill.

AUTO Leather Goods Co., 11276 Linden Ave., Stratford, Conn.

AUTO Top Co., 221 E. Columbia St., Fort Wayne, Ind.

BAKER & Lockwood Mfg. Co., Seventh & Wyandotte Sts., Kansas City, Mo.

BALTIMORE Buggy Top Co., 107-13 W. Mt. Royal Ave., Baltimore, Md.

BARNES-CURTISS Co., 147-49 W. 99th St., New York, N. Y.

BARTON Auto Top Co., 63-65 Fort St., E., Detroit, Mich.

BIEHLS Auto Top Co., 81 S. Fifth St., Reading, Pa.

BISON Trimming Co., 1183 Jefferson St., Buffalo, N. Y.

BLASIER-SANBORN Mfg. Co., 335 Columbia St., Utica, N. Y.

BLISS Auto Top Co., C. P., 12 W. 14th Ave., Denver, Colo.

BLUE Ribbon Auto & Carriage Co., 1720 Fairfield Ave., Bridgeport, Conn.

BOHNET & Co., John, Grand Ave. & Washtenaw St., Lansing, Mich.

BONDY Mfg. Co., 3112 Euclid Ave., Cleveland, O.

BOSTON Auto Top Co., 98-100 Massachusetts Ave., Boston, Mass.

BRUNN & Co., 980 Ellicott St., Buffalo, N. Y.

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CADILLAC Auto Painting & Trimming Co., 144-56 Congress St., W., Detroit, Mich. "Universal."

CENTRAL Auto Top Co., 421-25 N. Capitol Blvd., Indianapolis, Ind.

CHANSLOR & Lyon Top Co., 1208 S. Grand Ave., Los Angeles, Cal.

CHICAGO Auto Equipment Co., 808-10 W. Jackson Blvd., Chicago, Ill.

CHICAGO Carriage & Trimming Co., 3514-20 S. Michigan Ave., Chicago, Ill.

CHICAGO Coach & Carriage Co., 1223-31 S. Michigan Ave., Chicago, Ill.

COLLINGS Carriage Co., Front & Arch Sts., Camden, N. J.

COOLING Carriage Co., 402 French St., Wilmington, Del.

COLUMBIA Tire & Top Co., 922 Commonwealth Ave., Boston, Mass.

CREAM City Trimming Co., 67-71 Juneau Ave., Milwaukee, Wis.

DALLAS Buggy Top Co., 562 Main St., Dallas, Tex.

DECKER Auto Top Co., Fort & Beaubien Sts., Detroit, Mich.

DONEGAN Auto Body & Specialty Co., 338 Trumbull St., Hartford, Conn.

DUSTIN Auto Top & Slip Lining Co., 1200 Broadway, Denver, Colo.

EDWARDS Mfg. Co., 216-20 Monroe Ave., Detroit, Mich.

ELMWOOD Auto Top & Supply Co., 707 Main Ave., Elmwood Place, O.

EMPIRE Auto Top Co., 222-26 N. 21st St., Philadelphia, Pa.

ENNIS, W. G., 18 Cumberland St., Charleston, S. C.

ERDMAN-GUIDER Co., 2290 Woodward Ave., Detroit, Mich.

EUREKA Co., Rock Falls, Ill.

FALLS City Buggy Top Co., 128-30 S. Floyd St., Louisville, Ky.

FARNHAM-NELSON Co., 47 Union Ave., Boston, Mass.

FEHRING Carriage Co., 601-09 Third St., Columbus, Ind.

FISHER Auto Top Co., Norwalk, O.

FLEETWOOD Metal Body Co., Fleetwood, Pa.

FRANK, W. H., 22-24 Harrison St., New Rochelle, N. Y.

GATES Mfg. Co., 431 N. Capitol Ave., Indianapolis, Ind.

GECO—See Glover Equipment Co.

GEISEL, Otto E., 706 Chestnut St., Philadelphia, Pa.
(See page 501.)

GEISSEL & Sons, A., 485-87 N. Third St., Philadelphia, Pa.

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HOOD AND RADIATOR COVERS

For all pleasure cars and commercial vehicles—including trucks.

The Trade will find it to be both simple and economical to send to us for Hood and Radiator Covers. We make various styles and patterns for almost every motor vehicle manufactured.

The quality and workmanship cannot be surpassed. Deliveries are prompt. Prices low. Discounts are liberal.

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Manufacturers Seat, Hood and Radiator Covers

1517 Seventeenth St., Racine, Wis.

Manufacturers of AUTOMOBILE TOPS

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FACTORY, JOBBER and the DEALER

We have the measurements for nearly every car built since 1904. Write for quotations.

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IT BUILDS YOU YOUR OWN, STRONG BUSINESS

You may have sold some tires last year, but—ARE YOU BUILDING A PERMANENT BUSINESS?

Here's the Why of "General Satisfaction."

Quality is a fact in "General" Tires.

Not an ounce of reclaimed rubber.

They're made by the picked experts of Akron, in the most modern factory, by the most modern method.

Our original co-operation plan puts the "General" dealer—like the "General" Tire—ahead of the crowd.

Write Dealer Dept. and find how far ahead.

The General Tire & Rubber Co.

AKRON, O.

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TOPS (Continued)

AUTOMOBILE TOPS (Continued)

GLOVER Equipment Co., Indianapolis, Ind. "Geco."

GOLDE-PATENT Mfg. Co., 509-15 W. 56th St., New York, N. Y.

GRUNDY—See Sterling Top & Equipment Co.

HARTMAN-TOWNSEND Co., 14th & West Sts., Indianapolis, Ind.

HAWES Storm Front Co., 14 N. Monroe St., Coldwater, Mich.

HERRITY Co., E. A., 60 Summer St., Stamford, Conn.

HOLBROOK Co., West End Ave. & 67th St., New York, N. Y.

HOLCKER-ELBERG Mfg. Co., 16th & McGee Sts., Kansas City, Mo.

HOLDEN One-Man Top Co., 1764 Broadway, New York, N. Y.

HOLMES & Bostrom Bros., 915 National Ave., Milwaukee, Wis.

HYATT Auto Top Co., 210-20 Wood St., Trenton, N. J.

INDIANA Top & Vehicle Co., Laurenceburg, Ind.

INLAND Auto Top Factory, 221 S. Monroe St., Spokane, Wash.

INTERNATIONAL Top Co., Waterbury, Conn.

JEWETT Co., Geo. H., 172-74 Shrewsbury St., Worcester, Mass.

KINGSBURY-LEAHY Co., 131-33 Hudson Ave., Albany, N. Y.
(See page 107.)

KNAPP Co., A. C., 1735 Mt. Elliott Ave., Detroit, Mich.

KOEN'S Detachable Coupe & Limousine Top Works, 1387 Niagara St., Buffalo, N. Y.

KROH Mfg. Co., C. Z., 1212-14 Jackson Ave., Toledo, O.

LA DUE Auto Top Co., 1109 Monroe St., Toledo, O.

LANE, T. W., Amesbury, Mass.

LIMOUSINE Top Co., 2002 Factory St., Kalamazoo, Mich.
(See page 533.)

LOUD, Fred A., Franklin & Lansdowne Sts., Cambridge, Mass.

McAVOY Co., M. I., 1220 Washington St., Racine, Wis.
(See page 855.)

McDONALD Bros., 1009-11 E. Pike St., Seattle, Wash.

MACK Mfg. Co., Lancaster, Pa.

MANHATTAN Auto Top & Body Co., 221-23 W. 64th St., New York, N. Y.

MANN-ALDRICH Carriage Co., 1800 Lincoln St., Denver, Colo.

MATT & Co., F., 491 Washington St., Newark, N. J.

MERIDIAN Mfg. Co., Indianapolis, Ind.

MILWAUKEE Trimming Co., 549 E. Water St., Milwaukee, Wis.

MONAHAN Vehicle Co., Kinsley Ave. & Eagle St., Providence, R. I.

MOUNT Co., J. W., Maple Ave. & White St., Red Bank, N. J.

MURRAY & Co., P. A., Newton, Mass.

NATIONAL Auto Top Co., 510 W. Broad St., Richmond, Va.

NATIONAL Limousine Top Corp., 41 Letchworth St., Buffalo, N. Y.

NEWTON & Son, W. H., 127 Elm St., Cortland, N. Y.

NOVELTY Carriage Works, 815-17 Second Ave., Spokane, Wash.

OMAHA Auto Top Co., 709-11 S. 15th St., Omaha, Neb.

PATERSON Vehicle Co., 257-59 Market St., Paterson, N. J.

PEERLESS Buggy Top Co., York St. & Central Ave., Cincinnati, O.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O.
(See page 207.)

RANDS Mfg. Co., Detroit, Mich.
(See page 637.)

REARDON, J. J., Clark St., Amesbury, Mass.

REX Buggy Co., Connersville, Ind.

ROSS & Browne, 6127-29 Cottage Grove Ave., Chicago, Ill.

RUDD Auto Top Co., 46 Bagg St., Detroit, Mich.

ST. LOUIS Top Co., 3025-29 Olive St., St. Louis, Mo.

SCHREIBER Carriage Mfg. Co., Chariton, Ia.

SCOTT—See Star Storm Front Co.

SHARRER Patent Top Co., 245 W. 55th St., New York, N. Y.

SHIELDS Carriage Co., 11 Carriage Ave., Amesbury, Mass.

SIOUX City Auto Top Co., 310 Virginia St., Sioux City, Ia.

SNOW-MOSS Co., 147 W. 83d St., New York, N. Y.

SPRINGFIELD Auto Top & Upholstery Co., Sanford St., Springfield, Mass.

SPRINGFIELD Harness Co., 55-61 Dwight St., Springfield, Mass.

STANDARD Auto Top Co., 1338 Race St., Philadelphia, Pa.

STANDARD Top Co., (Kingston), Wilkes-Barre, Pa.

STANDARD Top & Equipment Co., 1212 Huron Rd., Cleveland, O.

STAR Storm Front Co., Canal St., Troy, O. "Scott."

STERLING Auto Top Co., Detroit, Mich.

STERLING Top & Equipment Co., 518-22 W. 57th St., New York, N. Y. "Grundy."

STONE & Sons, C., 1658-74 Ogden Ave., Chicago, Ill.

STORM Buggy & Auto Top Co., Fostoria, O.

SUTORIUS Auto Top Co., 621-23 Third Ave., S., Minneapolis, Minn.

THOMPSON Co., E. J. (Forbes Field), Pittsburg, Pa.

TOPFORD Co., 112-116 Grove St., Hempstead, N. Y.

UNION Top Mfg. Co., 346 Collins Ave., E., E. Pittsburg, Pa.

UNIVERSAL—See Cadillac Auto Painting & Trimming Co.

VEHICLE Top & Supply Co., 3414 Lindell Ave., St. Louis, Mo. "Vesco."

VESCO—See Vehicle Top & Supply Co.

VETTER Auto Top Co., 95-97 West End Ave., New York, N. Y.

WALKER & Co., Alfred J., 223 W. 66th St., New York, N. Y.

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Whip-Cord and Fabric

TIRES

With Angle and Runner Treads
Guaranteed for 5000 Miles Service
Red and Grey Inner Tubes

DEALERS

Get our proposition on exclusive territory, distributor prices and selling support on the tire that is

"Built to Meet the Demand for quality—not the competition of price."

THE MARATHON TIRE & RUBBER COMPANY
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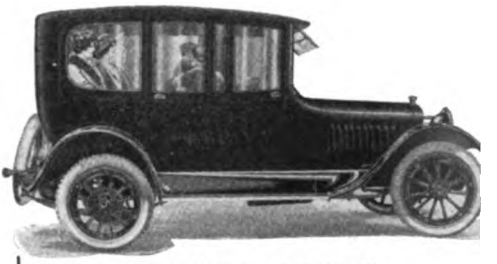
Canadian Plant, St. Catharines, Ont.



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Demountable Tops

for automobile manufacturers. We supply dealers and distributors with tops for the following cars:—Haynes, Chalmers, Mitchell, Packard, Stanley, Chevrolet.

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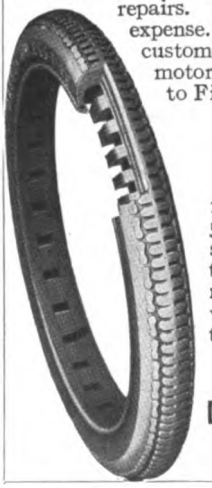

8000 Miles Guaranteed

for small sizes and 5000 miles for large sizes. This makes them the most economical tire in the world—and the best tire to sell.

Write at once for our new dealer's proposition.

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DAYTON, OHIO

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TOPS (Continued)

AUTOMOBILE TOPS (Continued)

WARDEN Co., Geo. J., 6530-34 Carnegie Ave., Cleveland, O.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O.
(See page 211.)

WAYNE Auto Top Co., 313-15 Riopelle St., Detroit, Mich.
(See page 531.)

WAYNESBURG Carriage Co., Waynesburg, O.

WEBER Co., M., 218-20 N. St. Clair St., Dayton, O.

WERNER & Sons, Geo., 1133-37 Main St., Buffalo, N. Y.

WESTERN Auto Top Co., 1208-10 Jackson St., Omaha, Neb.

WILCOX Co., M. I., Water St., Toledo, O.
(See page 805.)

WILSON Co., J. C., 15th & Warren Aves., Detroit, Mich.

WRIGHT & Co., C. E., Norfolk, Va.

TRANSFERS

DECALCOMANIA TRANSFERS

JEYERCORD Co., Chamber of Commerce Bldg., Chicago, Ill.

NATIONAL Decalcomania Co., 238-40 N. 60th St., Philadelphia, Pa.

PALM, Fechteler & Co., 67 Fifth Ave., New York, N. Y.

SMITH & Co., Geo. A., 136 Liberty St., New York, N. Y.
(See page 535.)

TREADS

DETACHABLE TIRE TREADS OR PROTECTORS

A. S. B.—See Queen Mfg. Co.

BRICTSON Mfg. Co., Brookings, S. D.

BUKOLT Mfg. Co., Stevens Point, Wis. "Highway."

COLORADO Tire & Leather Co., Tread Bldg., Denver, Colo. "Durable."

DAVIS Robe & Armor Co., 8 N. State St., Chicago, Ill.

DURABLE—See Colorado Tire & Leather Co.

HIGHWAY—See Bukolt Mfg. Co.,

INTERNATIONAL Rubber Co., Denver, Colo.

INVINCIBLE—See Sturges Co.

INVINCIBLE Tire Co., 53 Sabin St., Providence, R. I.

KIMBALL Tire Case Co., 168 Broadway, Council Bluffs, Ia.

KING Tire Protector Co., Matthews Bldg, Milwaukee, Wis.

LEATHER Tire Goods Co., Niagara Falls, N. Y. "Woodworth."
(See pages 82 and 83.)

MANSFIELD Tire & Rubber Co., Newman St., Mansfield, O.

MAPLEBAY Mfg. Co., Crookston, Minn.

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

PACIFIC—See Sturges Co.

QUEEN Mfg. Co., Webster City, Ia. "A. S. B."

SLAMA Tire Protector Co., 1504 Grand Ave., Kansas City, Mo.

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal. "Invincible," "Pacific," "Zig-Zag."

TRIPLE Tread Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

UNIVERSAL Tire Protector Co., Angola, Ind.

WEARPROOF Tire Products Co., 554 Van Ness Ave., San Francisco, Cal.

WOODWORTH—See Leather Tire Goods Co.

X X X Auto Accessory Co., Springfield, Mass.

ZIG-ZAG—See Sturges Co.

TREATING

HEAT TREATING

AMERICAN Chain Co., Bridgeport, Conn.
(See page 157.)

AMERICAN Metal Treatment Co., Elizabeth, N. J.
(See page 353.)

BIDLE Co., W. S., 1411 E. 45th St., Cleveland, O.

MEISEL Press Mfg. Co., 945 Dorchester Ave., Boston, Mass.
(See page 249.)

PENINSULAR Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

PERRY-FAY Mfg. Co., Elyria, O.
(See page 709.)

SCOTT, C. U., head of Wall St., Davenport, Ia.

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

WYMAN-GORDON Co., Worcester, Mass.
(See Back Bone.)

TRIMMINGS

CLOTH AND CARPET TRIMMINGS

(See also Broadcloth; also Buttons; also Carpet; also Cloth; also Lace; also Linoleum; also Silk; also Whipcord)

ALF Co., Edward F., 420 E. Eighth St., Cincinnati, O.

BARRELL Co., Wm. L., New York, N. Y.
(See page 319.)

BRIDGEPORT Coach Lace Co., 1731-37 Broadway, New York, N. Y.

CARR Co., F. S., 31 Beach St., Boston, Mass.
(See page 165.)

CHANDLER Oil Cloth & Buckram Co., East Taunton, Mass.

CHASE & Co., L. C., Boston, Mass.
(See page 313.)

DUSENBURY & Co., Louis, 222 Fourth Ave., New York, N. Y.

FINE Woolen Co., 58-60 Worth St., New York, N. Y.

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A TIRE of superior design, construction, material, workmanship and supervision. Immediate Delivery of all types and sizes. Guaranteed for 5000 Miles.

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"CAPITOL TIRES"

Made in Plain and Non-Skid. Recognized as the leading tire for the people. Strictly high grade and guaranteed. Grey Tubes—"Paragum." Red Tubes—"Redman." We have no affiliation or connection with any other company.

THE National Tire & Rubber Company

East Palestine, Ohio

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TRIMMINGS (Continued)

CLOTH AND CARPET TRIMMINGS (Continued)

GALLAND, Wechmar & Co., 456 Fourth Ave., New York, N. Y.

GERHAB, Jacob, 153-64 N. Third St., Philadelphia, Pa.

GIFFORD & Son, John A., 25 Park Pl., New York, N. Y.

HAARTZ, J. C., 136 Federal St., Boston, Mass.

HOOF Bros. Co., 232 W. Randolph St., Chicago, Ill.

HORSTMANN Co., Wm. H., Fifth & Cherry Sts., Philadelphia, Pa.

KENNEDY, Willing & Co., 526 Arch St., Philadelphia, Pa.

LAIDLAW Co., 126-32 W. 46th St., New York, N. Y.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

LOUNSBERY & Sons, G. H., 107-09 W. Third St., Cincinnati, O.

MOSSMAN, Yarnelle & Co., Pearl St. & Maiden Lane, Fort Wayne, Ind.

PATTERSON & Greenough, 45 E. 17th St., New York, N. Y.

PIET-ROBERTSON-RAINEY Co., 108 S. Howard St., Baltimore, Md.

ROEHM & Davison, Woodbridge & Wayne Sts., Detroit, Mich.

ROGERS & Co., E. F., 410 Arch St., Philadelphia, Pa.

SCHERER & Co., H., Detroit, Mich.

SCHLEGEL Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.

SHERWOOD, A. S., 754-56 Seventh Ave., New York, N. Y.

SHIRLEY Auto Fabric Co., 250 W. 54th St., New York, N. Y.

SLOANE, W. & J., Fifth Ave. & 47th St., New York, N. Y.

TEN EICK, Cornelius, 253 W. 47th St., New York, N. Y.

TIEL & Co., Geo., 418 Arch St., Philadelphia, Pa.

VOGT Mfg. & Coach Lace Co., 408-10 St. Paul St., Rochester, N. Y.

WIESE & Co., Wm., 234 W. 55th St., New York, N. Y.

METAL TRIMMINGS

(See also Fasteners, Curtain; also Fittings, Top: also Forgings, Drop; also Handles, Door; also Hinges, Door; also Locks, Door; also Irons, Slat; also Irons, Top; also Mouldings, Brass; also Rests, Bow; also Separators, Bow)

AMESBURY Brass & Foundry Co., Amesbury, Mass.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

CHICAGO-RACINE Aluminum, Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.

COWLES & Co., C., New Haven, Conn. (See page 257.)

DOUGLAS & Lomason Co., Detroit, Mich.

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

ENTERPRISE Brass & Plating Co., 2838-44 Spring Grove Ave., Cincinnati, O.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

METAL Stamping Co., 18th St. & Boulevard, Long Island City, N. Y.

MONARCH Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

PHOENIX Lock Works, 321-27 Third Ave., Newark, N. J.

SHERWOOD, A. S., 754-56 Seventh Ave., New York, N. Y.

SMITH & Co., Jos. N., Detroit, Mich. (See page 227.)

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WING Co., Charles, Amesbury, Mass. (See page 857.)

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

TRUCKS

BODY HANDLING TRUCKS

EQUIPMENT Mfg. Co., Warren, O. "Farmington."

FARMINGTON—See Equipment Mfg. Co.

REPAIR TRUCKS

(For lying on when making repairs underneath a car)

AUTOMOBILE Accessories Co., 816 W. North Ave., Baltimore, Md. "Norwood." (See page 681.)

BROWN Co., 212 Bellevue Ave., Syracuse, N. Y.

E-Z ROLLER—See Rice & Dayton Mfg. Co.

FAW, J. H., 41 Warren St., New York, N. Y. (See page 845.)

FRENCH, F. A., Braddock Ave. & Guthrie St., Pittsburg, Pa. "Getunder."

GEM—See Moeschl-Edwards Corrugating Co.

GETUNDER—See French, F. A.

IDEAL—See Lewis-Geer Mfg. Co.

KEYSTONE Wire Matting Co., Beaver Falls, Pa.

LEWIS-GEER Mfg. Co., Ypsilanti, Mich. "Ideal"

MACON Machine Co., 110 S. Rubey St., Macon, Mo.

MASCO—See Milwaukee Auto Specialty Co.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

MOESCHL-EDWARDS Corrugating Co., Eighth & Ninth Sts., Covington, Ky. "Gem."

NORWOOD—See Automobile Accessories Co.

PORTLAND Garage Co., 49-51 Cross St., Portland, Me.

RICE & Dayton Mfg. Co., 115-19 E. Fourth St., Cedar Falls, Ia. "E-Z Roller."

SIMPLEX Auto Specialty Co., 732 Woodward Ave., Detroit, Mich.

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WRECKING TRUCKS AND CASTORS

BIHLER, A. E., 111 S. 18th St., Omaha, Neb.

COLLINS Co., E. B., 201 W. Main St., Danville, Ill.

GUSS Co., O. G., Delphos, O. (See page 627.)

HOLMES & Bros., Robt., Danville, Ill. (See page 861.)

LAWSON—**See Menasha Wood Split Pulley Co.**

MASCO—**See Milwaukee Auto Specialty Co.**

MENASHA Wood Split Pulley Co., Menasha, Wis. "Lawson."

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

PROJECTA Co., East Milton, Mass.

RUB-ON Mfg. Co., 89 Brayton St., Buffalo, N. Y. (See page 285.)

WEAVER Mfg. Co., Springfield, Ill.

TRUNKS

LEATHER, FABRIC AND BOARD TRUNKS

AJAX Trunk & Sample Case Co., 144-50 W. 18th St., New York, N. Y.

ATCO—**See Auto Trunk Mfg. Co.**

AUTO Trunk Mfg. Co., 135 Spring St., New York, N. Y. "Atco."

BAILEY Co., R. B., 406 W. Pico St., Los Angeles, Cal.

BELBER Trunk & Bag Co., 1641 N. Hancock St., Philadelphia, Pa.

BERG Auto Trunk & Specialty Co., 400 Lafayette St., New York, N. Y.

BOYLE & Co., John, 112-14 Duane St., New York, N. Y.

DUPLEX—See Planet Co.

FARMERS Market Co., 711 Orange St., Wilmington, Del.

FITZGERALD Trunk Co., 1314 Wells St., Chicago, Ill.

FULLER Co., G. W., 182-84 Asylum St., Hartford, Conn.

KAMLEE Trunk Co., 252 Broadway, Milwaukee, Wis.

KING, W. A., 52 Public Sq., Cleveland, O.

KRONAUER & Co., Chas., 152 N. Desplaines St., Chicago, Ill.

McDONALD, Alevander, 15 Beacon St., Boston, Mass.

MORRISON & Co., L. E., 27 W. Washington St., Indianapolis, Ind.

PLANET Co., 180 N. Elm St., Westfield, Mass. "Duplex."

S. C. S.—See Simon & Co.

SAGE'S Trunk & Leather Goods Co., 134 Summer St., Boston, Mass.

SIMON & Co., S. C., 404-12 Brown St., Philadelphia, Pa. "S. C. S."

STALLMAN, F. A., 57 E. Spring St., Columbus, O.

TAYLOR Trunk Works, C. A., 39 E. Randolph St., Chicago, Ill.

TUTTLE & Clark, Jefferson & Bates Sts., Detroit, Mich.

UNITED Auto Trunk Co., W. 26th St., New York, N. Y.

WARREN Leather Goods Co., 30 Austin St., Worcester, Mass.

WINSHIP, W. W., 71 Summer St., Boston, Mass.

METAL TRUNKS

A-Z Co., 530 W. 56th St., New York, N. Y. (See page 417.)

CORRY Metal Products Co., Corry, Pa.

IMPERIAL—See Welch & Suthergeren Co.

NATIONAL Enameling & Stamping Co., 374-78 Broadway, New York, N. Y. "Nesco."

NESCO—See National Enameling & Stamping Co.

WELCH & Suthergreen Co., 30 Lunenburg St., Fitchburg, Mass. "Imperial."

TUBES

INNER TUBES

(For Complete Tires—See Tires, Pneumatic)

ACME Rubber Mfg. Co., Trenton, N. J.

ALLIANCE Rubber Co., Alliance, O. (See page 845.)

AMERICAN Rubber & Tire Co., 70-78 Beach St., Akron, O.

BATAVIA Rubber Co., Batavia, N. Y.

BELLE City—See Chicago Rubber Clothing Co.

BLODGETT Rubber Co., St. Joseph, Mich.

BOWERS Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

BRAENDER Rubber & Tire Co., Rutherford, N. J. (See page 551.)

BRUNSWICK-BALKE-COLLENDER Co., 623 S. Wabash Ave., Chicago, Ill.

BUCYRUS Rubber Co., Bucyrus, O.

CALIFORNIA—See Hendrie Rubber Co.

CENTAUR Rubber & Tire Co., 940-42 Second St., Gallipolis, O.

CHESTER Rubber Tire & Tube Co., Chester, W. Va.

CHICAGO Rubber Clothing Co., 1501 Albert St., Racine, Wis. "Belle City."

COLUMB Tyres Import Co., 1891 Broadway, New York, N. Y. (Importers.)

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

CONGRESS—**See McGraw Tire & Rubber Co.**

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic." (See page 685.)

CONVERSE Rubber Shoe Co., Malden, Mass. "Tuff-E-Nuff."

CORTLAND Tire & Rubber Co., 342 Cortland St., Belleville, N. J.

DAYTON Rubber Mfg. Co., 2346 Kiser St., Dayton, O. (See page 533.)

DE LUXE—See Thermoid Rubber Co.

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¶ Only one chassis design can be "best"—that's why we use the same construction on the MOON "39" (a four), the MOON "48" (a four), and the MOON "66" (a six).

¶ The different models vary in size only.

Moon Motor Car Co.
Saint Louis

Farmack Motor Car $855

Cabriolet $1155

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Lubrication—Self-contained, constant level, splash system.
Carbureter—Stromberg.
Starting, Lighting and Ignition—Splitdorf Magneto, Bijur Starting Motor and Lighting Generator, 2-unit system, charging a 6-volt Willard storage battery.
Clutch—Cone.
Rear Axle—Full floating.
Tires—33 x 4", non-skid on rear. Goodyear or Firestone.
Control—Left side drive, center control.
Springs—Front, semi-elliptic; rear, three-quarter elliptic.
Wheelbase—112".
Equipment—One-man Mohair top, dust boot, side curtains, rain and clear vision windshield, speedometer, instrument light, electric head lamps, with dimming bulbs, tail light, electric horn, tire holder, robe rail, foot rail, complete roll tools, tire repair kit, pump, jack, etc.
Touring Car, 2360 pounds Roadster, 2250 pounds

FARMACK MOTOR CAR CORPORATION
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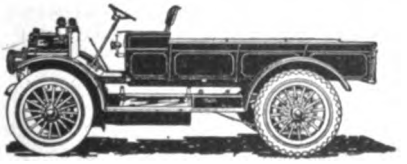

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E	—1500 lbs. capacity—see illustration . .	$950
F	—2000 lbs. capacity—chassis only . . .	$1500

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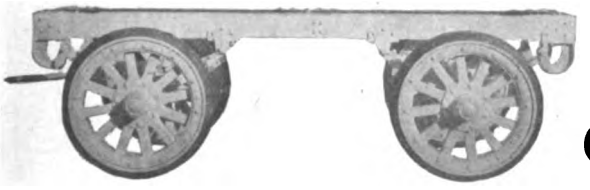
CHICAGO U S A



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TUBES (Continued)

INNER TUBES (Continued)

DOUBLE Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.

DUJARDIN Rubber Co., 1697 Broadway, New York, N. Y.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ENDURANCE Tire & Rubber Co., New Brunswick, N. J.

FALLS Rubber Co., Cuyahoga Falls, O.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

FIRESTONE Tire & Rubber Co., Akron, O.

FISK Rubber Co., Chicopee Falls, Mass.

GAULOIS Tire Corp., 49 W. 64th St., New York, N. Y. (Importers.)

GLOBE Rubber Tire Mfg. Co., Trenton, N. J.

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GORDON Tire & Rubber Co., Canton, O.

GREENSBURG Tire & Rubber Co., Greensburg, Pa. "Isbest," "Pyramid," "Red Wing," "Silver Grey."
(See page 649.)

HAMILTON Rubber Mfg. Co., Trenton, N. J. "Perfection."
(See page 505.)

HENDRIE Rubber Co., W. C., Torrance, Cal. "California."

HOME Tire Co., Trenton, N. J.

HOOD Rubber Co., Watertown, Mass.
(See page 533.)

HOWE Rubber Co., New Brunswick, N. J.
(See page 853.)

IDEAL—See Voorhees Rubber Mfg. Co.

IMPERIAL—See McGraw Tire & Rubber Co.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind.
(See page 523.)

ISBEST—See Greensburg Tire & Rubber Co.

KANSAS City Tire & Rubber Corp., Kansas City, Mo.

KEATON Tire & Rubber Co., 616-24 Van Ness Ave., San Francisco, Cal.

KEYSTONE Rubber Mfg. Co., Erie, Pa.
(See page 521.)

KNIGHT Tire & Rubber Co., Canton, O.

KOKOMO Rubber Co., Kokomo, Ind.

L. & M. Rubber Co., Carrollton, O.

LANCASTER Tire & Rubber Co., Lancaster, O.

LEE Tire & Rubber Co., Conshohocken, Pa. "Velvet."

McCLURG Rubber Co., Coshocton, O.

McGRAW Tire & Rubber Co., East Palestine, O. "Imperial," "Congress," "Pullman."
(See page 521.)

MANSFIELD Tire & Rubber Co., Newman St., Mansfield, O.

MARATHON Tire & Rubber Co., Cuyahoga Falls, O.
(See page 533.)

MATTSON Rubber Co., Lodi, N. J.
(See page 827.)

MICHELIN Tire Co., Milltown, N. J.
(See Inside Back Cover.)

MILLER Rubber Co., Akron, O.

MODEL—See Voorhees Rubber Mfg. Co.

MOHAWK Rubber Co., Second & River Sts., Akron, O.

NATIONAL Rubber Co., Pottstown, Pa.
(See page 535.)

NASSAU—See Thermoid Rubber Co.

NATIONAL Tire & Rubber Co., East Palestine, O. "Paragon."
(See page 535.)

NEW Castle Rubber Co., New Castle, Pa.

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

NORWALK Tire & Rubber Co., Norwalk, Conn.

NUGUM—See Sussex Rubber Co.

O. K.—See Oliver Rubber Mfg. Co.

OLIVER Rubber Mfg. Co., 2208 Broadway, Oakland, Cal. "O. K."

PACKARD—See Pharis Tire & Rubber Co.

PARAGON—See National Tire & Rubber Co.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

PERFECTION—See Hamilton Rubber Mfg. Co.

PERFECTION Motor Tube Co., 5012 Euclid Ave., Cleveland, O.

PHARIS Tire & Rubber Co., Newark, O. "Packard."
(See page 833.)

PORTAGE Rubber Co., Barberton, O.

PORTER Rubber Co., Salem, O.

PULLMAN—See McGraw Tire & Rubber Co.

PYRAMID—See Greensburg Tire & Rubber Co.

QUAKER City Rubber Co., Philadelphia, Pa.
(See page 839.)

RACINE Auto Tire Co., 200 Clark St., Racine, Wis.

RACINE Rubber Co., Racine, Wis.
(See page 525.)

RED WING—See Greensburg Tire & Rubber Co.

REPUBLIC Rubber Co., Youngstown, O.

RUBBER Products Co., Barberton, O.
(See page 811.)

RUTHERFORD Rubber Co., Rutherford. N. J. "Sterling."

SAVAGE Tire Co., Main & Sicard Sts., San Diego, Cal.

SCHAVOIR Rubber Co., Stamford, Conn.

SEAMLESS Rubber Co., 534 Congress Ave., New Haven, Conn.

SEARLE Unburstable Inner Tube Co., 1893 Broadway, New York, N. Y.

SEDRALA—See Semple Rubber Co.

SEMCO—See Semple Rubber Co.

SEMPLE Rubber Co., 112 Murray St., Trenton, N. J. "Sedrala," "Semco."

SILVER GREY—See Greensburg Tire & Rubber Co.

STANDARD Tire & Rubber Mfg. Co., Hippodrome Bldg., Cleveland, O.
(See page 519.)

STERLING—See Rutherford Rubber Co.

SUSSEX Rubber Co., Paterson Ave., Rutherford, N. J. "Nugum."

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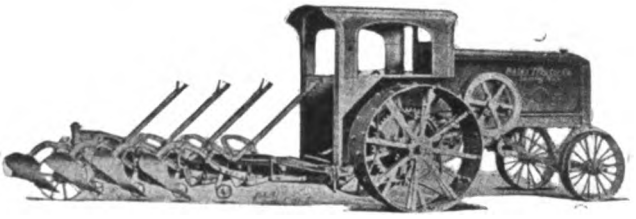

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TUBES (Continued)

INNER TUBES (Continued)

TEN Broeck Tyre Co., 840 S. 26th St., Louisville, Ky.

THERMOID Rubber Co., Trenton, N. J. "De Luxe," "Nassau."
(See pages 81 and 289.)

TOLEDO-FINDLAY Tire & Rubber Co., Western Ave., Findlay, O.

TUFF-E-NUFF—See Converse Rubber Shoe Co.

TYER Rubber Co., Andover, Mass. "Tyrian."

TYRIAN—See Tyer Rubber Co.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.,

VELVET—See Lee Tire & Rubber Co.

VICTOR Rubber Co., Springfield, O.
(See page 529.)

VITALIC—See Continental Rubber Works.

VOORHEES Rubber Mfg. Co., Jersey City, N. J. "Model," "Ideal."

VULCAN Rubber Co., Ninth & State Sts., Erie, Pa. "Vulco."

VULCANIZED Products Co., Muskegon, Mich.

VULCO—See Vulcan Rubber Co.

WILSON Tire & Rubber Co., Springfield, Ill.
(See page 857.)

ZEE Zee Tire & Rubber Co., 33d & Walnut Sts., Philadelphia, Pa.

SPEAKING TUBES

(For Limousine Telephones—See Telephones, Limousine: For Annunciators—See Annunciators)

BRIDGEPORT Coach Lace Co., 1731-37 Broadway, New York, N. Y.

COWLES & Co., C., New Haven, Conn.
(See page 257.)

ENGLISH & Mersick Co., 154-60 Winchester Ave., New Haven, Conn.

NORWALK Mfg. Co. (East Norwalk), Norwalk, Conn.

PERPENTE Mfg. Co., State & Wall Sts., New Haven, Conn.

SCHLEGEL Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.

TAYLOR Co., H. D., 101-05 Oak St., Buffalo, N. Y.

TUBING

ALUMINUM TUBING

ALUMINUM Co. of America, Pittsburg, Pa.
(See page 479.)

IVINS Tube Works, Elwood, Oak Lane Station, Philadelphia, Pa.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727, and 819.)

BRASS AND COPPER TUBING

AMERICAN Brass Co. (Ansonia Brass & Copper Branch), Ansonia, Conn.

AMERICAN Brass Co. (Benedict & Burnham Branch), Waterbury, Conn.

AMERICAN Brass Co. (Coe Brass Branch), Torrington, Conn.

AMERICAN Brass Co. (Kenosha Branch), Kenosha, Wis.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CHASE Rolling Mill Co., Waterbury, Conn.

CORNELIS & Gridley, Wolcott St., Waterbury, Conn.

DETROIT Copper & Brass Rolling Mills, Clark Ave. below Wabash R. R., Detroit, Mich.

ERIE-BUFFALO Tube Co., 18th & Cranberry Sts., Erie, Pa.

FRENCH Mfg. Co., 142 Robbins St., Waterbury, Conn.

IVINS Tube Works, Elwood, Oak Lane Station, Philadelphia, Pa.

MACKENZIE-WALTON Co., Pawtucket, R. I.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727 and 819.)

MICHIGAN Copper & Brass Co., 1611 Jefferson Ave. W., Detroit, Mich. "Wolverine."

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (Distributors.)
(See page 867.)

NATIONAL Brass & Copper Tube Co., 41 Park Row, New York, N. Y.

NATIONAL Co., Brown's Rd., Waterbury, Conn.

NEW Jersey Tube Co., Newark, N. J.

RANDOLPH-CLOWES Co., Waterbury, Conn.

ROBERTS Tube Works, 868 Military Ave., Detroit, Mich.

ROME Brass & Copper Co., Rome, N. Y.

ROME Hollow Wire & Tube Co., Railroad St., Rome, N. Y.

STANDARD Brass & Copper Tube Co., Woodbridge & Division Sts., New London, Conn.

UNIFORM Seamless Wire Co., 71 Peck St., Providence, R. I.

UNITED Wire & Supply Co., 109 Summer St., Providence, R. I.

WATERBURY Mfg. Co., Waterbury, Conn.

WELLS & Co., A. H., Watertown Rd., Waterbury, Conn.

WOLVERINE—See Michigan Copper & Brass Co.

COPPER TUBING

(See Tubing, Brass and Copper)

FIBRE TUBING

(See Fibre, Hard)

FLEXIBLE METALLIC TUBING

ALMOND Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass.
(See page 547.)

AMERICAN Metal Hose Co., 67 Jewelry St., Waterbury, Conn.

ATLANTIC Metal Hose Co., 1777 Broadway, New York, N. Y.

ATLANTIC Tubing Co., 1756 Cranston St., Providence, R. I.

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FLEXIBLE METALLIC TUBING (Continued)

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y.

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

CHICAGO Tubing & Braiding Co., 216-24 N. Clinton St., Chicago, Ill.

COATES Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.

DUOFLEX—See Fischer Spring Co.

FISCHER Spring Co., Chas., 88-90 Walker St., New York, N. Y. "Duoflex."

FLEXIBLE Armored Hose Co., 752 Main St., Buffalo, N. Y.

LOMBARDI Motor Car Co., 67-71 Minerva St., Derby, Conn.

METAL Hose & Tubing Co., Raymond & Tillary Sts., Brooklyn, N. Y. "Triplexd."

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.) (See pages 547, 727 and 819.)

NONPAREIL Horn Mfg. Co., 73-75 Wooster St., New York, N. Y.

PENNFLEX—See Pennsylvania Flexible Metallic Tubing Co.

PENNSYLVANIA Flexible Metallic Tubing Co., Broad & Race Sts., Philadelphia, Pa. "Pennflex."

SAFETY-ARMORITE Conduit Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

STANDARD Metal Mfg. Co., Newark, N. J. (See page 277.)

TRIPLEXD—See Metal Hose & Tubing Co.

U. S. Flexible Metallic Tubing Co., Boyd & Omar Sts., Los Angeles, Cal.

WEBB Mfg. Co., ft. Center St., Newark, N. J. (See page 739.)

HARD RUBBER TUBING

(See Rubber, Hard)

IRON-LINED BRASS TUBING

PHENIX Tube Co., 182 N. 11th St., Brooklyn, N. Y.

ROME Mfg. Co., Railroad St., Rome, N. Y.

SOFT RUBBER TUBING

ACME Rubber Mfg. Co., Trenton, N. J.

ALLIANCE Rubber Co., Alliance, O. (See page 845.)

ATLANTIC Tubing Co., 1756 Cranston St., Providence, R. I.

BOSTON Belting Co., 84 Linden Park St., Boston, Mass.

BOSTON Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass.

BOWERS Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

CANFIELD Rubber Co., Bridgeport, Conn.

CINCINNATI Rubber Mfg. Co., Cincinnati, O. (See page 763.)

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

CONTINENTAL Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic." (See page 685.)

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

ESSEX Rubber Co., Trenton, N. J.

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

FIRESTONE Tire & Rubber Co., Akron, O.

GOODRICH Co., B. F., Akron, O.

HAMILTON Rubber Mfg. Co., Trenton, N. J. (See page 505.)

HODGMAN Rubber Co., 306 Broadway, New York, N. Y.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind. (See page 523.)

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill. "Usco."

MECHANICAL Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

MILFORD Rubber Works, Milford, Ill.

MILLER Rubber Co., Akron, O.

MINERALIZED Rubber Co., 165 Chambers St., New York, N. Y.

NATIONAL India Rubber Co., Bristol, R. I.

NEW Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

NEW York Belting & Packing Co., 91 Chambers St., New York, N. Y.

NORWALK Mfg. Co. (East Norwalk), Norwalk, Conn.

PARKER, Stearns & Co., 286 Sheffield Ave., Brooklyn, N. Y.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

QUAKER City Rubber Co., Philadelphia, Pa. (See page 839.)

SEAMLESS Rubber Co., 534 Congress Ave., New Haven, Conn.

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

TYER Rubber Co., Andover, Mass. "Tyrian."

TYRIAN—See Tyer Rubber Co.

UNITED States Tire Co., Broadway & 58th St., New York, N. Y.

USCO—See Mechanical Rubber Co.

VITALIC—See Continental Rubber Works.

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

STEEL TUBING

AMERICAN Steel Tube Co., 369 S. Erie St., Toledo, O.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

BECKER Steel Co. of America, 90 West St., New York, N. Y. (Importers.)

DELAWARE Seamless Tube Co., Auburn, Pa

DETROIT Seamless Steel Tubes Co., Detroit, Mich.

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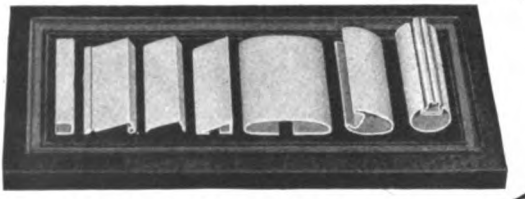

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TUBING (Continued)

STEEL TUBING (Continued)

ELISCO—See Elyria Iron & Steel Co.

ELYRIA Iron & Steel Co., E. 131st St., Cleveland, O. "Elisco."
(See page 543.)

FIELD & Co., 723 Arch St., Philadelphia, Pa. (Distributors.)
(See page 547.)

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (Distributers.)
(See page 491.)

IVINS Tube Works, Elwood, Oak Lane Station, Philadelphia, Pa.

KRUPP—See Prosser & Son.

METALLIC Products Co., 200 Fifth Ave., New York, N. Y. (Distributors.)
(See pages 547, 727 and 819.)

MORRIS & Co., E. K., 311-17 W. Second St., Cincinnati, O. (Distributors.)
(See page 809.)

MURCOTT-DUDEN Co., 253 Broadway, New York, N. Y. (Distributors.)
(See page 867.)

NASH Co., George, 217 Pearl St., New York, N. Y. (Distributors.)
(See page 547.)

NATIONAL Tube Co., Frick Bldg., Pittsburg, Pa. "Shelby."

OHIO Seamless Tube Co., Shelby, O.
(See page 545.)

PITTSBURGH Steel Products Co., Frick Annex, Pittsburg, Pa.

PROSSER & Son, Thomas, 15 Gold St., New York, N. Y. (Importers.) "Krupp."

SHELBY—See National Tube Co.

STANDARD Steel Tube Co., Toledo, O.
(See Inside Front Cover.)

STANDARD Welding Co., Cleveland, O. "Stanweld."
(See Book Mark.)

STANWELD—See Standard Welding Co.

TOLEDO Steel Tube Co., Toledo, O.

WARD'S Sons, Edgar T., 25 Purchase St., Boston, Mass. (Distributors.)
(See page 547.)

PENINSULAR Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

UNION Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.

WILCOX, Crittenden & Co., 883 Main St., Middleton, Conn.

TURNTABLES

AUTOMOBILE TURNTABLES

(See also Castors and Wheel Trucks)

BEACH Auto Turntable Co., T. C., 818 Lansing St., St. Johns, Mich.

BICYCLE Step Ladder Co., 6 W. Randolph St., Chicago, Ill. "Murray."

CANTON Foundry & Machine Co., Canton, O. "Universal."
(See page 677.)

ELLIOTT Co., Sterling, Newton, Mass.

ERNST'S Sons, C. F., 75 Lathrop St., Buffalo, N. Y.

LANSING Co., Lansing, Mich.

LINK-BELT Co., 732 Dime Bank Bldg., Detroit, Mich.
(See page 155.)

MURRAY—See Bicycle Step Ladder Co.

NICOLS & Bro., George P., Old Colony Bldg., Chicago, Ill.

NORTHERN Engineering Works, 2 Chene St., Detroit, Mich.

PERFECTION—See Zering Mfg. Co.

PORTLAND Garage Co., 49-51 Cross St., Portland, Me.

ROCHESTER Iron Works, Powers Bldg., Rochester, N. Y.

SMITH Iron Co., G. W. & F., Gerard St., Boston, Mass.

TURNER Machine Co., 28-32 Maple Ave., Danbury, Conn.

UNITED Casting Co., Wilson & Violet Sts., Los Angeles, Cal.

UNIVERSAL—See Canton Foundry & Machine Co.

ZERING Mfg. Co., H., 528-30 Reading Rd., Cincinnati, O. "Perfection."

TURN-BUCKLES

WROUGHT TURN-BUCKLES

CLEVELAND Hardware Co., Hamilton Ave., Cleveland, O.

COLUMBUS Bolt Works Co., Columbus, O.
(See page 119.)

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

HASKELL Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

KANSAS City Bolt & Nut Co. (Sheffield Station), Kansas City, Mo.

MERRILL Bros., Maspeth, N. Y.

MICHIGAN Bolt & Nut Co., ft. Meldrum Ave., Detroit, Mich.

NEW England Bolt & Steel Co., Bowdoin St. (Everett), Boston, Mass.

PAWTUCKET Mfg. Co., 327 Pine St., Pawtucket, R. I.

TWINE

TUFTING TWINE

MEYER & Co., John C., Lowell, Mass.

TRAVERS Twine & Cordage Co., 81 Warren St., New York, N. Y.

UNIONS

PIPE UNIONS

(See Fittings, Pipe)

TUBING UNIONS

AMERICAN Pin Co. (Waterville Station), Waterbury, Conn.

CRUM-WILEY Mfg. Co., Peru, Ind.

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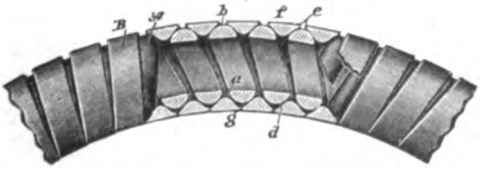

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UNIONS (Continued)

TUBING UNIONS (Continued)

DOLE Valve Co., 208 N. Fifth Ave., Chicago, Ill.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

LAVIGNE Mfg. Co., 625-41 Commonwealth Ave., Detroit, Mich.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

McRAE & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

OSBORNE & Stephenson Mfg. Co., Plainville, Conn.
(See page 709.)

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

PRESBREY Co., E. H., 432 Fourth Ave., New York, N. Y. (Distributors.)
(See page 807.)

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

RICHARDSON-PHENIX Co., 122-28 Reservoir Ave., Milwaukee, Wis. "Union Cinch."

ROBERTS Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

UNION CINCH—See Richardson-Phenix Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WILLIAMS Valve Co., D. T., Spring Grove Ave., & Township St., Cincinnati, O.

ZERK Mfg. Co., Cleveland, O.

VALVES

ANGLE, GLOBE, CHECK AND GATE VALVES

BASHLIN Co., Warren, Pa.

BELFIELD Co., H., 435 N. Broad St., Philadelphia, Pa.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CRANE Co., 836 S. Michigan Ave., Chicago, Ill.

DETROIT Brass Works, 2000 Brooklyn Ave., Detroit, Mich.

DETROIT Lubricator Co., Detroit, Mich.
(See page 677.)

EXETER Brass Works, Exeter, N. H.

JARECKI Mfg. Co., 149 E. Ninth St., Erie, Pa.

JENKINS Bros., 80 White St., New York, N. Y.

KELLY & Jones Co., Greensburg, Pa.

KINSEY & Mahler Co., 400 S. Adams St., Peoria, Ill.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O. "Renewo."

McDONALD Mfg. Co., A. Y., Dubuque, Ia.

McNAB & Harlan Mfg. Co., 55 John St., New York, N. Y.

MILWAUKEE Valve Co., 139 Burrell St., Milwaukee, Wis.

PITTSBURG Valve Foundry & Construction Co., 26th St. & A. V. Ry., Pittsburg, Pa.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.
(See page 781.)

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

RENEWO—See Lunkenheimer Co.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

STEPHENS Mfg. Co., Roe, Clayton & Parkinson Aves., Detroit, Mich.

WALWORTH Mfg. Co., Boston, Mass.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

AUTOMATIC FUEL SHUT-OFF VALVES

(For turning off fuel in case of fire)

UNDERWRITERS Valve Co., Industrial Trust Bldg., Providence, R. I.

BALL CHECK VALVES

CRUM-WILEY Mfg. Co., Peru, Ind.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

GAS ENGINE VALVES

(For Valves in the rough—See Forgings, Drop)

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

LEWIS Electric Welding & Mfg. Co., 4086 Detroit Ave., Toledo, O.
(See page 549.)

MICHIGAN Engine Valve Co., 115-17 Columbia St., West, Detroit, Mich.
(See page 549.)

MORGAN Mfg. Co., John St., Newport, R. I.

RICH Tool Co., 410 Railway Exchange, Chicago, Ill.

SCHLIEDER Mfg. Co., 2628-38 Grand Blvd., E., Detroit, Mich.

STEEL Products Co., Cleveland, O.
(See page 296.)

GASOLINE LOCK VALVES

BRADLEY Safety Auto Lock Co., Wyoming Bldg., Denver, Colo.

BURKHARDT Mfg. Co., G., 2123 N. Clark St., Chicago, Ill. "Perfection."

ESCO Mfg. Co., 23-25 Warren Ave., W., Detroit, Mich.

Complete Index to Classification appears on Pages 8 to 27.

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Lewis Valves

Grey Iron Heads
Nickel Steel Heads
Made with the famous Lewis "X" Alloy

When an engine maker once uses Lewis Inlet and Outlet Valves he "comes back for more." There are good reasons. Try Lewis Valves and you won't need to be told. But here's to tell you, if you haven't tried them.

First—The name Lewis is known for honest service. G. L. Lewis, head of this company, has "been through the mill" from start to finish, and knows what engine men want in *valves*. This Service means quick work and accurate work.

Second—The quality of Lewis alloys is undeviating. Grey iron, nickel steel, "X Alloy," or your own special composition if you prefer; you can rely on specifications being filled with absolute accuracy.

LEWIS VALVES

This trademark is your safeguard

MEMBER

The Lewis Electric Welding & Mfg. Co.
4086 Detroit Avenue, Toledo, Ohio

MICHIGAN POPPETS

BEST FOR YOUR MOTOR

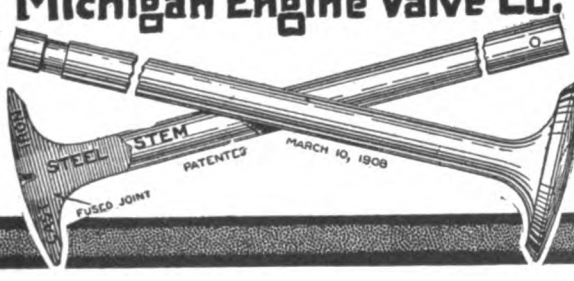
because the heads of gray iron (conceded to be the best metal for valves) cannot possibly work loose.

MICHIGAN VALVES

are of construction proper for their work: Stems of piston-rod steel, accurately ground, and discs of gray iron fused on the stem by a patented process. This method of attaching makes disc and stem strictly integral.
Gray iron cannot warp under the heat, and being a softer metal wears the valve seat very little.
MICHIGAN VALVES are perfect—every one tested and inspected—and their construction keeps them so. Result: Efficient and economical operation of motor, and minimum re-grinding of valves.
Send for sample valve. Inspect the fused-on discs.
Let us figure on your requirements.

Michigan Engine Valve Co.

115-117 Columbia Street West



Detroit Michigan U.S.A.

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VALVES (Continued)

GASOLINE LOCK VALVES (Continued)

GASOLOCK—See Headlight Support Co.

GLOBE Auto Lock Co., Canisteo, N. Y.

HEADLIGHT Support Co., 723 Woodward Ave., Detroit, Mich. "Gasolock."

HILL—See Janney, Steinmetz & Co.

HILL—See Norwalk Iron Works Co.

JANNEY, Steinmetz & Co., Philadelphia, Pa. "Hill."
(See page 515.)

LOXAUTO Mfg. Co., 408½ Occidental Ave., Seattle, Wash.

McRAE & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

NORWALK Iron Works Co., South Norwalk, Conn. "Hill."

PERFECTION—See Burkhardt Mfg. Co.

GATE VALVES

(See Valves, Angle)

GLOBE VALVES

(See Valves, Angle)

MIXING VALVES

(See Vaporizers)

MUFFLER CUT-OUT VALVES

BARCO Brass & Joint Co., 212-22 W. Illinois St., Chicago, Ill.

BUFFALO Pressed Steel Co., Military Rd., Buffalo, N. Y.

DUNCO—See Dunkirk Corp.

DUNKIRK Corp., Dunkirk, N. Y. "Dunco."

EMPIRE—See S. B. R. Specialty Co.

ESSEX—See S. B. R. Specialty Co.

G. P.—See Piel Co.

GABRIEL Mfg. Co., 1407 40th St., N. E., Cleveland, O.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GRAY-HAWLEY Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

HANDY—See Lunkenheimer Co.

HUBBARD, R. L., 4 Gouverneur St., Newark, N. J.

HUSK—See Western Brass Mfg. Works.

INTERNATIONAL Automobile Supply Co., 117 W. South Water St., Chicago, Ill.

LOSEE, J. S. Hebron, Ill.

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O. "Handy."

NATIONAL Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

OLDBERG Mfg. Co., Detroit, Mich.
(See page 345.)

PETRY Co., N. A., Philadelphia, Pa.
(See page 551.)

PIEL Co., G., 13th St. & Boulevard, Long Island City, N. Y. "G. P."

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

POWELL Muffler & Timer Co., 312-14 Catherine St., Utica, N. Y.
(See page 357.)

RUDIE—See Western Brass Mfg. Works.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Essex," "Empire."

STANHOPE Forge & Machine Works, 49-51 Lansdowne St., Cambridge, Mass.

STAR Brass Works, 2623 McGee Ave., Kansas City, Mo.

STRYKER, C. W., 240 Shonnard St., Syracuse, N. Y.

TABER Carburetor Co., 239-41 Water St., Binghamton, N. Y.
(See page 707.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "Rudie," "Husk."
(See page 817.)

YANKEE Co., 69 Genesee St., Utica, N. Y.

NEEDLE VALVES

AMERICAN Brass & Iron Co., Detroit, Mich.
(See page 183.)

DETROIT Brass Works, 2000 Brooklyn Ave., Detroit, Mich.

LUNKENHEIMER Co., 223 E. Eighth Ave., Binghamton, N. Y.

POWELL Co., Wm., 2525 Spring Grave Ave., Cincinnati, O.
(See page 781.)

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

PRESSURE REGULATING VALVES

(See Regulators, Pressure)

STEAM SAFETY VALVES

AMERICAN Steam Gauge & Valve Mfg. Co., 220 Camden St., Boston, Mass.

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

STEPHENS Mfg. Co., Roe, Clayton & Parkinson Aves., Detroit, Mich.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

STEAM THROTTLE VALVES

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

TIRE VALVES

ATLAS Auto Supply Co., 662 W. Austin Ave., Chicago, Ill. "Day."
(See page 177.)

DAY—See Atlas Auto Supply Co.

DOUBLE Seal Tire Valve Co., 16 W. 61st St., New York, N. Y.

ST. LOUIS Pneumatic Valve Co., 2520-26 N. Spring Ave., St. Louis, Mo.

SCHRADER'S Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y.
(See page 255.)

Complete Index to Classification appears on Pages 8 to 27.

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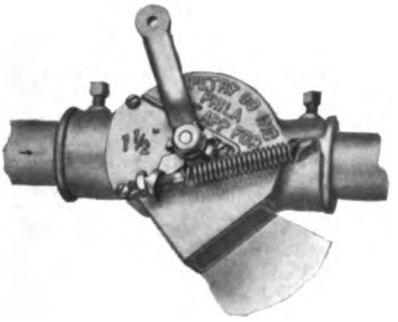
THE PETRY CUT-OUT
FOR ALL CARS

The most advanced type of Muffler Cut-Out which acts positively under all conditions, never becomes carbon clogged and acts as a warning signal when the horn fails.

The mechanical features of the PETRY are not found in any other Cut-Out. The valve, located in the center of the moving gases, *cannot flutter*. Its perfect fit prevents leaks. The lever is instantly adjustable to any position and simplifies installation and operation and does away with the use of unnecessary cables, etc.

The closing spring, while positive, has an easy action, and in order to overcome friction of pedal or other attachments, the spring tension is readily adjustable by simply turning a nut, which is automatically locked in position. Particular attention has been paid to locating the spring away from the body of the CUT-OUT. This prevents the spring losing its tension from the heat of the exhaust.



The PETRY Cut-Out is fully guaranteed. It is neat, strong and cannot get out of order. It is accurately machined and fits snugly over the exhaust pipe, being held in place with a set screw at each end.

Outside Diameter of Exhaust Pipe	*Prices*
1¼" to 1¾" inclusive	$3.00 each
1⅞" to 2½" "	3.50 "
2⅜" to 3" "	4.00 "

N. A. Petry Company, Inc.
Manufacturers
PHILADELPHIA, PA.

"Bull Dog" Non-Skid

When you have used BRAENDER TIRES & TUBES You have found "The Tyre to Tie To"

Made in all Types and Sizes

DEALERS!

Write Dept. "B" today for territory proposition

BRAENDER RUBBER & TIRE CO.

RUTHERFORD, N. J.

NEW YORK: 250 West 54th Street
CHICAGO: 1350 S. Michigan Ave.
PHILADELPHIA: 1327 Race Street

Trade Mark

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VALVES (Continued)

TIRE SAFETY VALVES

ARTIZAN Brass Co., 230 N. Jefferson St., Chicago, Ill.

AUTOMATIC Safety Tire Valve Co., 819 Free Press Bldg., Detroit, Mich. (See page 721.)

HENEMIER—See Riess Mfg. Co.

MIZENER Supply Co., Decorah, Ia.

MYERS Auto Tire Safety Valve Co., Postal Telegraph Bldg., Chicago, Ill.

RIESS Mfg. Co., 1688 Broadway, New York, N. Y. "Henemier."

TWO WAY TANK VALVES

(Fuel Reserve Valves or Cocks)

BREEZE Carbureter Co., 250-52 South St., Newark, N. J.

CRUM-WILEY Mfg. Co., Peru, Ind.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

HANCOCK Mfg. Co., 770 Henry St., Charlotte, Mich.

IDEAL Brass Works, Tenth & Canal Sts., Indianapolis, Ind.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O. "Quadlock."

QUADLOCK—See Lunkenheimer Co.

ROBERTS Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

VANADIUM

AMERICAN Vanadium Co., Vanadium Bldg., Pittsburg, Pa.

VAPORIZERS

GASOLINE VAPORIZERS OR MIXING VALVES

LUNKENHEIMER Co., 223 E. Eighth Ave., Cincinnati, O. "Quadlock."

NONPAREIL—See Lunkenheimer Co.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 781.)

WILKINSON Co., Wm. H., West Medway, Mass.

WILLIAMS Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

VARNISHES

AKRON Varnish Co., Akron, O.

AMERICAN Varnish Co., 1138 N. Branch St., Chicago, Ill.

ANGLO-AMERICAN Varnish Co., 53-63 Johnson St., Newark, N. J.

ARMITAGE & Co., John L., Newark, N. J

ATLANTIC Varnish Works, Richmond, Va.

AULT & Wilborg Co., New, Seventh & Culvert Sts., Cincinnati, O.

B. P. S.—See Patterson-Sargent Co.

BAY STATE—See Wadsworth, Howland & Co.

BECKWITH-CHANDLER Co., 320 Fifth Ave., New York, N. Y.

BERRY Bros., Detroit, Mich.

BILLINGS-CHAPIN Co., Cleveland, O.

BOSTON Varnish Co., (E. Everett), Everett, Mass.

BROOKS & Co., Clarence, 249-77 Chestnut St., Newark, N. J.

BUCKEYE Paint & Varnish Co., 15th & Lucas Sts., Toledo, O. (See page 589.)

BULLS-EYE—See Zinsser & Co.

CHASE, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y. "Kismet."

CHI-VAR-CO—See Chicago Varnish Co.

CHICAGO Varnish Co., 2100 Elston Ave., Chicago, Ill. "Chi-Var-Co."

CINCINNATI Varnish Co., 211 South St., Cincinnati, O.

CLEVELAND Varnish Co., 3111 E. 87th St., Cleveland, O. "Frelastic."

COLUMBUS Varnish Co., Columbus, O. (See page 209.)

DEVOE & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

ELMENDORF Varnish Co., 345 Larrabee St., Chicago, Ill.

EMPIRE Varnish Co., 2633-42 E. 76th St., Cleveland, O.

FLINT Varnish & Color Works, Flint, Mich.

FLOOD & Conklin Co., 186 Chestnut St., Newark, N. J. "Radium."

FOREST City Paint & Varnish Co., 3234 Lakeside Ave., Cleveland, O.

FRELASTIC—See Cleveland Varnish Co.

FRENCH & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

GILLESPIE & Son, Chas. H., 19 Dey St., Jersey City, N. J.

GLIDDEN Varnish Co., Cleveland, O. (See page 553.)

GOLD CROSS—See Stewart-Mowry Co.

GRAVES Co., N. Z., 22-26 S. Third St., Philadelphia, Pa.

GREGG Varnish Co., St. Louis, Mo.

HILDRETH Varnish Co., 90 West St., New York, N. Y.

INTERNATIONAL Mfg. & Sales Co., 6304 Wallace St., Chicago, Ill. "Schein."

KISMET—See Chase, Roberts & Co.

LUCAS & Co., John, 322-30 Race St., Philadelphia, Pa.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

MOLLER & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y.

MOORE & Co., Benjamin, 281-33 Front St., Brooklyn, N. Y.

MOUND City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

MURPHY Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.

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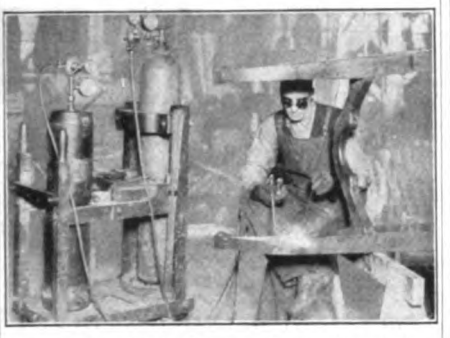
Oxy-Acetylene Welding and Cutting



The Prest-O-Lite Process is an important factor in "Marmon 34" frame construction

Follow the Trend of the Car Manufacturer—Use Welding for Repairs

Investigate the economies and better class of work that are now being effected by many leading automobile manufacturers through oxy-acetylene welding.

Welding supplies the best and cheapest method of metal joining—far superior to riveted or threaded unions. Welded parts machine perfectly, and if required can be given additional strength. Parts and repairs that would be too intricate to attempt commercially by any other method, are simple routine oxy-acetylene welding practice.

In repair work, in saving time and avoiding costly replacement of broken or worn parts, the savings to be made are almost unlimited. Thousands are now using this process. You can attain the best results with the least outlay of capital by employing the

Prest-O-Lite PROCESS

Employs both gases (acetylene and oxygen) in portable cylinders. Prest-O-Lite Dissolved Acetylene (ready-made carbide gas) is backed by Prest-O-Lite Service, which provides dry, purified gas, insuring better welds, quicker work, lower cost and also avoids the large initial outlay and heavy depreciation incurred in making crude acetylene in a carbide generator.

Necessary equipment is not expensive. We furnish high-grade welding apparatus for $60 (Canada, $75); acetylene service at additional cost. Adaptable for oxy-acetylene cutting by the purchase of special cutting blow pipe. Thorough instructions are furnished free to every user of Prest-O-Lite Dissolved Acetylene, so that any average workman who understands metals can learn the process quickly and easily.

Extra Income For Garages

Oxy-acetylene welding repair work provides an extra income for garages too large to be overlooked. It is a splendid opportunity for enterprising men to get into business for themselves. Send for details.

Right now you may be doing work that the Prest-O-Lite Process would simplify, improve and reduce the cost. Our illustrated free literature is full of examples of actual work done. Send for it.

The Prest-O-Lite Company, Inc.

The World's Largest Makers of Dissolved Acetylene

Main Offices and Factory, 1400 Speedway, Indianapolis, Ind.

Canadian Office and Factory, Merritton, Ontario

53 Branches and Charging Plants

Output Depends on Application

BRUSH

SPRAY

DIP

Varnish application influences production. Whether you brush, spray or dip your product, its production is limited to the possibilities of the process you adopt. The process determines the varnish. Not every varnish can be sprayed. Some kinds are made for dipping, others for brushing and only the right process and the right quality varnish will bring maximum results.

Be sure of both process and varnish. Use

Glidden

Quality Auto Varnishes

and take advantage of the Glidden Research Service. Let the Glidden Chemists and testers study your problems and help speed up your production and boost quality at the same time.

The Glidden man brings experience from other factories in your line as well as over 40 years' experience in quality varnish making. Put in a call for him today—absolutely no obligation.

The Glidden Varnish Company

Manufacturers of Glidden's Pale Wearing Body Varnishes, Quick Rubbing Varnishes, Fender Finishing Enamel, Colored Rubbing Varnishes, Red Metal Primer, etc.

Cleveland, Ohio

Factories
Cleveland, Ohio
Toronto, Can.

Branches
New York—Chicago
London

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VARNISHES (Continued)

PARROTT Varnish Co., 458 N. Washington Ave., Bridgeport, Conn.

PATTERSON-SARGENT Co., E. 38th & St. Clair Sts., Cleveland, O. "B. P. S."

PAYSON Varnish Co., 141st St. & Walnut Ave., New York, N. Y.

PRATT & Lambert, Buffalo, N. Y.

QUEEN City Varnish Co., Cincinnati, O.

RADIUM—See Flood & Conklin Co.

SCHEIN—See International Mfg. & Sales Co.

SCHRACK & Co., C., 152 N. Fourth St., Philadelphia, Pa.

SHERWIN-WILLIAMS Co., 100 Canal St., Cleveland, O.

SMITH & Co., Edward, Sixth St. & West Ave., Long Island City, N. Y.

STANDARD Varnish Works (Elm Park), Port Richmond, N. Y.

STEWART-MOWRY Co., 2214 Shields Ave., Chicago, Ill. "Gold Cross."

STULB Varnish Co., Joseph, Haddon Ave. & White Horse Pike, Camden, N. J.

VALENTINE & Co., 456 Fourth Ave., New York, N. Y. "Vanadium."

VANADIUM—See Valentine & Co.

WADSWORTH, Howland & Co., 84 Washington St., Boston, Mass. "Bay State."

WESTERN Reserve Varnish Co., 1251 Marquette Rd., Cleveland, O.

WHEELER Varnish Works, 2260 Elston Ave., Chicago, Ill.

ZINSSER & Co., W., 195 William St., New York, N. Y. "Bulls-Eye"

VENTILATORS

HOOD VENTILATORS

GARLAND—See Ross-Wortham Co.

ROSS-WORTHAM Co., McCormick Bldg., Chicago, Ill. "Garland."

LIMOUSINE AND FORE DOOR VENTILATORS

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

COWLES & Co., C., New Haven, Conn.
(See page 257.)

DOUGLAS & Lomason Co., Detroit, Mich.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

O'BRIEN Mfg. Co., Joseph F., 63 Park Pl., New York, N. Y.
(See page 223.)

OCHSNER & Sons Co., A., 1060 State St., New Haven, Conn.

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco."
(See page 613.)

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

WIND SHIELD VENTILATORS

MORRIS Hardware Co., Connellsville, O. "Ventor."

SECURITY Co., 56 Terminal Way, Pittsburgh, Pa.

VENTOR—See Morris Hardware Co.

VISORS

WIND SHIELD VISORS AND RAIN SHIELDS

FREY Mfg. Co., 1326 Michigan Ave., Chicago, Ill. "U-Can-C."

ROAD-VIEW—See Smith & Co.

SMITH & Co., Jos. N., Detroit, Mich. "Road-View."
(See page 227.)

U-CAN-C—See Frey Mfg. Co.

VOLTMETERS

(See Ammeters; also Gauges, Battery)

VULCANIZERS

PORTABLE VULCANIZERS

ADAMSON Mfg. Co., East Palestine, O. "Universal."
(See page 795.)

ANDERSON, N. M., Worthington, Ind.

AUTO Steam Vulcanizer Co., Cincinnati, O.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CHAMPION, F. M., 236 Elizabeth St., Utica, N. Y.

ELECK-TRICK—See Gibney Tire & Rubber Co.

EXHAUST Heater Vulcanizer Co., Altoona, Pa.

5 MINUTE Vulcanizer & Auto Supply Co., 121 E. 18th St., Kansas City, Mo. "Low's."

GIBNEY Tire & Rubber Co., Conshohocken, Pa. "Eleck-Trick."

GILLILAND Mfg. & Auto Supply Co., D. C., 4247 Beethoven Ave., St. Louis, Mo.

GILSON Motor Starting Co., 940 N. Pennsylvania St., Indianapolis, Ind.

GWYNN-BACON Vulcanizer Co., 3155 Magnolia Ave., St. Louis, Mo.

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

JUNIOR—See Cleveland Auto Specialty Co.

KENMORE Mfg. Co., 15 N. Crawford Ave., Chicago, Ill.

LAWALL Vulcanizer & Mfg. Co., 41 N. Eighth St., Richmond, Ind.

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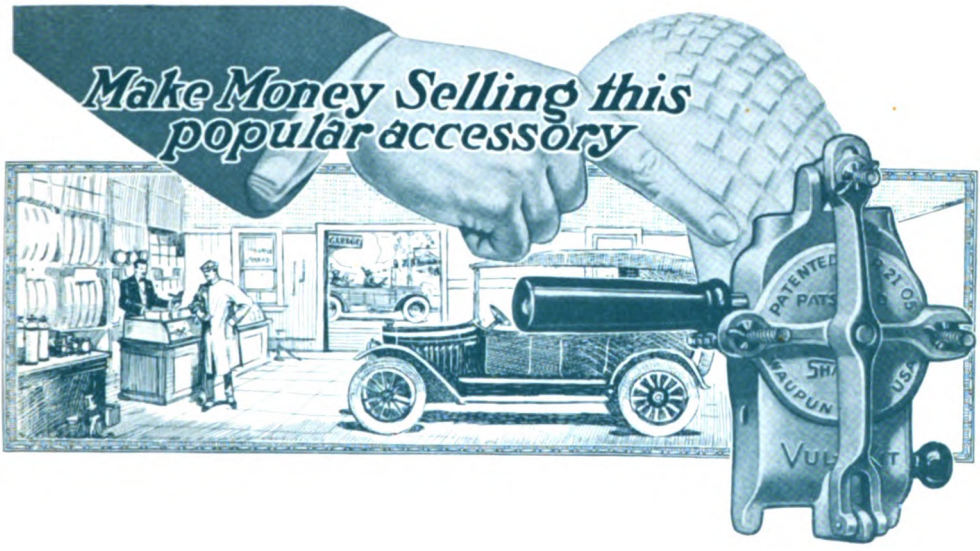

Accessory dealers sold more than 100,000 Shaler Vulcanizers last year. This year's business is showing a huge increase. These are some of the reasons.

Every motorist is a prospect for this safe, simple tire repair kit for mending tubes and minor casing cuts.

No car is equipped with a tire-saving device—the motorist must buy it from his dealer.

Shaler Vulcanizers have been continuously kept before the motoring public by a ten-year advertising campaign, which this year includes more than sixty publications.

The superiority of the Shaler Line in selling appearance, as well as in mechanical construction, has placed it far beyond all competition. The Shaler organization has prospered and increased, while more than two hundred concerns who placed substitutes or imitations on the market have come and gone.

Order from your jobber. Write us today for information about the free selling helps we supply to dealers.

C. A. SHALER CO.

902 Fourth Street, Waupun, Wisconsin

OLDEST AND LARGEST VULCANIZER MANUFACTURERS

Canadian Distributors: John Millen & Son, Limited, Toronto, Winnipeg, Montreal, Vancouver

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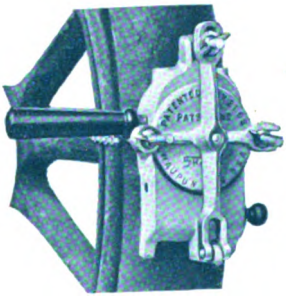
SHALER

THE FAMOUS TOURIST'S REPAIR KITS

Type G, No. 32

VUL-KIT

For all sized tubes & casings



Retail Price $3.50

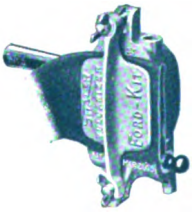
Dealer's Price $2.25

Tubes are repaired by clamping between a flat face of the Vul-Kit and an asbestos inlaid plate which is swivelled to insure uniform pressure all over a repair. Casings are mended while fully inflated, as shown above, with a 3½x4" curved surface. As no exposed blaze is produced, this vulcanizer can be used close under a fender without danger. The lamp, which burns both gasoline and alcohol, absorbs all the fuel so that it is impossible to spill blazing liquid even if upset. Cannot overcure or undercure a repair. Complete with repair material. Polished nickel. Weight, 5 lbs.

Type H, No. 33

FORD-KIT

For Ford Size tubes & casings



Retail Price $2.75

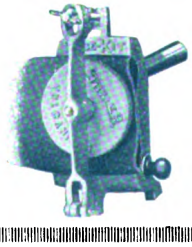
Dealer's Price $1.75

Especially designed to fit 3" and 3½" Ford tubes and casings. It mends all tube injuries and small casing cuts or sandpockets perfectly. Operates on the same principle as the Vul-Kit described above. Safe and simple—any one can use it. Burns gasoline or alcohol without dangerous exposed blaze. The fuel is absorbed by a burner so that it is impossible to spill burning liquid. Complete with repair material. Weight, 5 lbs. Nickel plated.

Type F, No. 31

TUBE-KIT

For all sized tubes



Retail Price $2.00

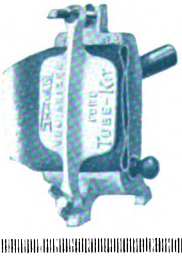
Dealer's Price $1.25

An inexpensive, yet absolutely reliable tourists' outfit to be carried in the car for mending tube punctures. Burns gasoline or alcohol without smoke, soot or dangerous exposed flame. Cannot spill burning fuel if accidentally upset. Handle detachable. Vulcanizing surface 3½" in diameter. Easy to apply to tubes because attachment is secured by tightening only one thumbscrew. Complete with repair material. Weight, 4 lbs. Nickel plated.

Type I, No. 34

FORD TUBE-KIT

For Ford size tubes



Retail Price $1.75

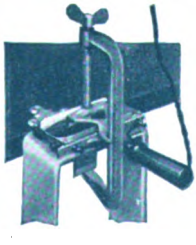
Dealer's Price $1.10

When the only requirement of a vulcanizer is tube repairing, and cheapness is the important consideration, this model is all one needs. It has the same tube repairing capacity as the Ford-Kit. Gasoline or alcohol may be used for fuel. Complete with repair material. Nickel plated. Weight, 4 lbs.

Type D, No. 83

PRIVATE GARAGE

Model (Electric)



Retail Price $12.50

Dealer's Discount 25%

Has twice the capacity of any other vulcanizer for tube and casing work. Clamping device and a specially designed vulcanizing surface enable the machine to work equally well close to bead or on tread of an inflated tire. Heats from city lighting current, the cleanest and safest source, so has no equal for home use, where practically all repairing is done. Temperature regulated by a thermostat automatically. When several repairs are to be made in succession, as is usual, the hot vulcanizer can be moved from one to another without delay by means of the cool handle. Polished nickel. Weight, 13 lbs. Supplied with complete repair outfit.

NATIONALLY ADVERTISED. CARRIED IN STOCK BY ALL JOBBERS

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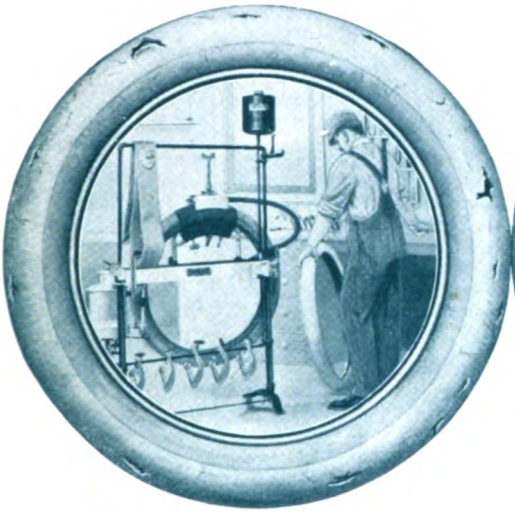

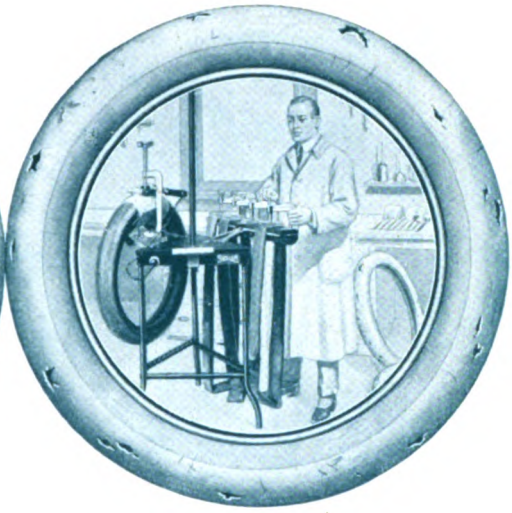

SHALER

Shop Vulcanizers

A satisfactory shop vulcanizer should fulfill these four requirements:

1. It must handle every practicable kind of tire repairing perfectly.
2. It must be simple and safe to operate.
3. The **method of preparing repairs** must be within the ability of the ordinary garage helper.
4. The first cost must be low.

Shaler Vulcanizers with automatic temperature control, using the Wrapped Tread Method of mending casings, are ideal in these respects.

The Shaler system has been used by tire makers for many years. A great many thousand Shaler Vulcanizers, both steam and electric, are in daily use in the best repair shops.

Choose the equipment that is making good and has continued to make good since tire repairing was in its infancy.

Exclusive Features

1. Less repair material and less time are required for preparing repairs than by any other method.
2. No airbags or extra moulds are necessary for all sized tires.
3. The tire is not disfigured, as in sectional repairs.
4. Repairs are heated from inside and outside of tire at the same time, reducing the time required and insuring a thorough cure.
5. The repair is mechanically as strong as the rest of the tire.
6. The vulcanizer has its temperature regulated automatically.

WRITE FOR COMPLETE DESCRIPTION AND CATALOG

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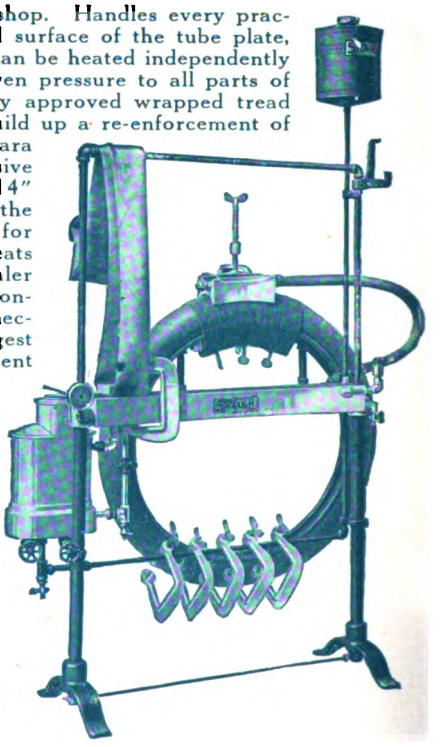
SHALER

STEAM VULCANIZING PLANT

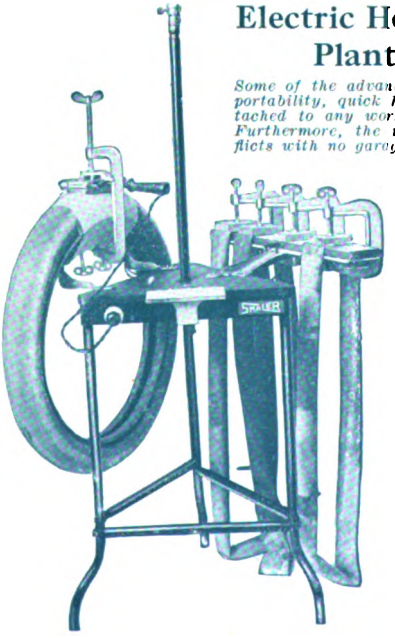


Covers all requirements of a garage or repair shop. Handles every practicable sort of tube and casing repairs. Machined surface of the tube plate, 4x30", vulcanizes six tubes as quickly as one and can be heated independently of casing attachment. Swivelled clamps insure even pressure to all parts of any tube repair. All sizes of casings repaired by approved wrapped tread method as used by tire manufacturers. Simply build up a re-enforcement of fabric inside the casing, and fill the hole with Para gum (it is unnecessary to cut away a lot of expensive rubber and fabric). The inside casing mandrel, 14" long, then applies heat directly against the fabric; the outside casing form, which has one side shaped for tread repairs, the other to fit close to the rim, heats from the outside. A wrapping of tape and the Shaler clamping device force new and old material into contact under enormous pressure. No air bags are necessary. The resulting repair becomes the strongest part of the tire. In order to fail, the re-enforcement would have to be torn loose and blown through the original hole, practically an impossibility. No attention is necessary after lighting burner. The boiler, a copper coil, raises steam in about twenty minutes and holds it at the right pressure indefinitely, a thermostat regulating the flame. Steam gauge and thermometer serve as a check on the operation by indicating both pressure and temperature. Safety valve eliminates danger of explosion.

Specify whether gas or gasoline burner is desired. Gasoline burner furnished unless otherwise specified.

Type NPR No. 41—Complete Garage Outfit as shown. Weight 190 lbs $50.00
(Includes 6 clamps and blocks for tube work, bead strips for rim cuts, casing clamps, tape for wrapping threads, thermometer, steam gauge and safety valve)
Type N No. 41—Same as above but equipped for tube work only, weight 150 lbs. $35.00

Electric Heated Plant



Some of the advantages of a vulcanizing plant heated electrically are simplicity, portability, quick heating, and that each unit may be purchased separately, attached to any workbench or table and used for its own distinct kind of work. Furthermore, the use of electric heated vulcanizers is perfectly safe and conflicts with no garage regulations.

This plant, Type ACE, consists of the complete units Type A, Type C and Type E, mounted on a strong tubular stand. It will do the same perfect work and has the same capacity as Type NPR steam plant—twenty tubes and one casing per hour.

Type C (inside casing form) and Type E (tube plate) are permanently attached to the stand and have switches to permit independent heating. Type A (outside casing form) has five feet of conductin cord with a plug which fits a socket in the stand or any lamp socket if work is to be done elsewhere on inflated tires. All wiring is complete in the stand and connection to city current is made overhead, out of the way, through a plug at the top of the upright standard by means of extension cord to any lamp socket. No special wiring needed, as the entire apparatus uses less current than a flatiron.

Type ACE No. 101 for A. C., weight 115 lbs. $60.00
For rheostat controlled direct current equipment add $10 list
Write for prices and descriptions of the separate units for workbench installation.

NATIONALLY ADVERTISED. SOLD BY ALL LEADING ACCESSORY JOBBERS
PRICES ON THIS PAGE SUBJECT TO 25% TRADE DISCOUNT

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ZENITH CARBURETOR

Known the world over as the Zenith of simplicity and efficiency.

This famous plain tube precision instrument is built in many sizes for every class of motor service.

Write us about your carburetion problems.

Zenith Carburetor Co.
Detroit, Mich.

Connects You with More Business

This automatic button sets the current when you push it, and shuts it off completely and permanently when the job is done. Other so-called automatic vulcanizers don't do this. So the Premier practically has the field to itself. The Premier makes tire vulcanizing simple and safe. It couples onto an electric light socket, or a battery as preferred.

PREMIER AUTOMATIC ELECTRIC VULCANIZER

Motorists have been waiting for an article like this that lets them make their own tire repairs, without expense, trouble, or danger. They are reading about the Premier now in the Saturday Evening Post and automobile papers. And they are looking for the man ready to sell them one. Be that man in your territory. Write us today for literature, prices and terms.

Retail Price $3.50 with Complete Outfit.

PREMIER ELECTRIC COMPANY
4053 Ravenswood Avenue CHICAGO, ILL.
Northern Electric Company, Limited
Distributors for Canada

SURE STICK ELECTRIC VULCANIZER

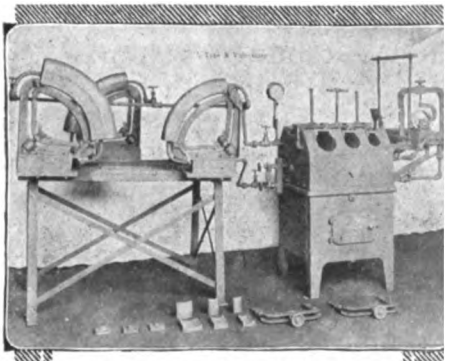
Operates off 6-volt Storage Battery, complete with outfit including attaching cord and clips and a supply of cement and para rubber sufficient for from ten to fifteen punctures, directions for using, etc.
Weight less than 2 lbs.

Price $3.00

A good outfit for your own use and one of the best sellers on the market.

Mfrd. by

SACKETT & OGDEN
Columbus, O.



AKRON RUBBER MOLD & MACHINE CO.

VULCANIZERS

Are the most modern and economical tire repair equipment on the market. Type B, illustrated above, is a 3-cavity vulcanizer with self-contained boiler, set of straight side or Q. D. Clincher Bead Molds with each cavity and Inside Patch Vulcanizer.
All our vulcanizers are fully guaranteed.
Send for our booklet on Vulcanizers and Accessories.

Also Large Tire Equipment Builders
Akron Rubber Mold & Machine Co.
Akron, Ohio, U. S. A.

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VULCANIZERS (Continued)

PORTABLE VULCANIZERS (Continued)

LAZARUS Mfg. Co., Belmont Bldg., Cleveland, O. "Lazco."

LAZCO—See Lazarus Mfg. Co.

LOW'S—See 5 Minute Vulcanizer & Auto Supply Co.

MAPES, Lee C., 16 Fulton Ave., Rochester, N. Y. "Superior."

MARVEL Accessories Mfg Co., West Sixth St., & Lakeside Ave., Clevealnd, O. (See page 775.)

MASCO—See Milwaukee Auto Specialty Co.

MEISER & Co., G. H., 6823 S. Chicago Ave., Chicago, Ill. "Quick Action."

MIDLAND Supply Co., 209 E. Second St., Davenport, Ia.

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco," "Radio."

NATIONAL Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O. "Wizard."

NEW Process Vulcanizer Co., 665-67 Spring St., Toledo, O. "Vul-car."

NURINKLE—See Stevenson, R. E.

PERFECTION—See Sterling Specialty Mfg. Co.

PREMIER Electric Co., 4053 Ravenswood Ave., Chicago, Ill. (See page 559.)

QUICK ACTION—See Meiser & Co.

RADIO—See Milwaukee Auto Specialty Co.

SACKETT & Ogden, Columbus, O. "Sure-Stick." (See page 559.)

SHALER Co., C. A., 902 Fourth St., Waupun, Wis. "Vul-Kit." "Stitch-In-Time." (See pages 555 to 558.)

SIMPLEX Vulcanizer Co., 2422 Manderson St., Omaha, Neb.

STERLING Specialty Mfg. Co., 119 Verplank St., Buffalo, N. Y. "Perfection."

STEVENSON, R. E., 518 N. Capitol Ave., Indianapolis, Ind. "Nurinkle."

STITCH-IN-TIME—See Shaler Co.

SUPERIOR—See Mapes, Lee C.

SURE-STICK—See Sackett & Ogden.

SWAIN, C. E., 860 N. Virgil Ave., Los Angeles, Cal.

UNIVERSAL—See Adamson Mfg. Co.

VUL-CAR—See New Process Vulcanizer Co.

VUL-KIT—See Shaler Co.

W-B—See Western Brass Mfg. Works.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "W-B." (See page 817.)

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

WETHERHOLT Sporting Goods Co., 155 N. High St., Columbus, O.

WHEELING Stove & Range Co., 36 19th St., Wheeling, W. Va.

WIZARD—See National Motor Supply Co.

WORCESTER Mfg. Co., 18 Grafton St., Worcester, Mass.

SHOP VULCANIZERS

ACME Supply Co., Ionia, Mich.

AKRON Rubber Mold & Machine Co., Akron, O. "Tip-Top." (See page 559.)

AKRON-WILLIAMS—See Williams Foundry & Machine Co.

ALLEN—See Diamond Mfg. Co.

ARTHUR Vulcanizing Machine Co., Griswold St., Warren, O.

AUTO-TIRE Vulcanizing Co., 140 Powell St., Lowell, Mass. "Lowell."

BADGER—See Tire Repair Equipment Co.

BIGGS Boiler Works Co., Akron, O.

BURGE Machine Works, 218-30 N. Jefferson St., Chicago, Ill. "Excelsior."

DIAMOND Mfg. Co., Des Moines, Ia. "Allen."

EXCELSIOR—See Burge Machine Works.

GIANT—See H & H Mfg. Co.

H. & H. Mfg. Co., 511 N. Ninth St., Lafayette, Ind. "Giant."

HAYNER—See Mason Mfg. Co.

HAYWOOD Tire & Equipment Co., 719 N. Capitol Ave., Indianapolis, Ind.

HILL-STAGE Co., 604 Jackson St., Anderson, Ind.

LOWELL—See Auto-Tire Vulcanizing Co.

MAPES, Lee C., 16 Fulton Ave., Rochester, N. Y. "Superior."

MARTIN & Bro., Fred., 161 Bertie St., Pomona, Cal.

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O. (See page 775.)

MASON Mfg. Co., Mason, Mich. "Hayner."

MILLER, Chas. E., 1400 S. Meridian St., Anderson, Ind.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium."

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

O'NEIL Tire & Rubber Co., W. Exchange & Water Sts., Akron, O.

PROGRESSIVE Mfg. Co., 468 64th Ave. (West Allis), Milwauke, Wis.

RADIUM—See Milwaukee Auto Specialty Co.

SHALER Co., C. A., 902 Fourth St., Waupun, Wis. (See pages 555 to 558.)

SOUTHWARK Foundry & Machine Co., 400 Washington Ave., Philadelphia, Pa.

STANDARD Welding & Mfg. Co., 951 Main St., Buffalo, N. Y.

SUPERIOR—See Mapes, Lee C.

TIP-TOP—See Akron Rubber Mold & Machine Co.

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THE JEFFERY SIX

The car of spectacular performance.

Thos. B. Jeffery Co.
KENOSHA, WIS.

Jeffery
MOTOR CARS & TRUCKS

The Jeffery Six Seven Passenger	$1,450
The Jeffery Four Roadster	1,000
The Jeffery Four Seven Passenger	1,035
The Jeffery Four Five Passenger	1,000
The Jeffery Quad	2,850
The Jeffery Rapid-Service Wagon	900
The Jeffery All-Purpose Truck	1,400

Prices F. O. B. Kenosha.

MONITOR CARS

Touring and Roadster.
Unit Power Plant.
High Tension Magneto.
Schebler Carburetor.
12 V. Generator and Starter
Tuthill Springs.
4-30 Models $795.
6-40 Model $895.

Write for specifications

THE CUMMINS-MONITOR CO.
402 Mt. Vernon Ave., Columbus, Ohio

STEPHENS SIX

A Real Family Car at $1125

40 horsepower Stephens-Continental motor—six cylinders cast en bloc.
Electric starting and lighting.
Left hand drive, center control.
Five-passenger body.
115-inch wheelbase.
Goodyear 32x4-inch Quick-Detachable tires.
10-*inch road clearance.*
Drive through spiral beveled gear adding to strength, durability, smoothness and quiet.
Full equipment for touring, which includes every desired accessory.
Weight, fully equipped, 2800 pounds.
Price $1125, f. o. b. Freeport, Illinois.

Stephens Motor Branch
OF MOLINE PLOW COMPANY
Paid-up Capital $19,000,000

Factory: Freeport, Ill.
Sales Office: Moline, Ill.

Schacht

1½, 2 and 3-ton capacity worm-drive trucks.

Territory open to responsible agents.

WORM DRIVE TRUCKS

The G. A. Schacht Motor Truck Company, Cincinnati, Ohio, U. S. A.

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VULCANIZERS (Continued)

SHOP VULCANIZERS (Continued)

TIRE Repair Equipment Co., 740 Johnson St., Appleton, Wis. "Badger."

VANDERPOOL Co., 722 W. Mulberry St., Springfield, O.

WHEELING Stove & Range Co., 36 19th St., Wheeling, W. Va.

WILLIAMS Foundry & Machine Co., Cherry St., Akron, O. "Akron-Williams."

WARMERS

FOOT WARMERS

(See Heaters, Automobile)

WASHERS

CORK WASHERS

ACCO—See Armstrong Cork Co.

ARMSTRONG Cork Co., 124 23d St., Pittsburg, Pa. "Acco."
(See page 187.)

DIAMOND Cork Co., 59 Pearl St., New York, N. Y.

MUNDET & Son, L., King, Ferris & Sullivan Sts., Brooklyn, N. Y.

PADDOCK Cork Co., 1209-17 De Kalb Ave., Brooklyn, N. Y.

SPANISH-AMERICAN Cork Co., 2211 Pennsylvania Ave., Baltimore, Md.

FELT WASHERS

ADVANCE Felt Specialty & Cutting Co., 159 W. Harrison St., Chicago, Ill.
(See page 853.)

AUBURN Leather Goods Co., Auburn N. Y.
(See page 309.)

BOOTH Felt Co., Detroit, Mich.
(See page 563.)

BRAUNSDORF, Geo. W., 430 E. 58th St., New York, N. Y.

BRAWLEY, T. R., 85-87 Adams St., Brooklyn, N. Y.
(See page 567.)

HOUSE & Sons, Chas. W., Unionville, Conn.

RHODES & Co., J. H., 162 W. Kinzie St., Chicago, Ill.

STANDARD Felt Co., West Alhambra, Cal.

STAR Felt Cutting Co., 260 69th St., Brooklyn, N. Y.

SUTHERLAND Co., F. L., 139 Beaubien St., Detroit, Mich.
(See page 813.)

WESTERN Felt Works, 4115-33 Ogden Ave., Chicago, Ill.
(See page 565.)

FINISHING WASHERS

CRANDAL, Stone & Co., Binghamton, N. Y.
(See page 469.)

KEELER Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

READ Co., A. P., 568 W. Washington St., Chicago, Ill.

STANLEY Works, New Britain, Conn.
(See page 269.)

IRON AND STEEL WASHERS

AMERICAN Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

BETTCHER Mfg. Co., Cleveland, O.

BOSSERT Co., Utica, N. Y.
(See page 279.)

CLARK Bros. Bolt Co., Milldale, Conn.
(See page 119.)

CLEVELAND Wrought Washer Co., 3590 W. 58th St., Cleveland, O.

COLUMBUS Bolt Works Co., Columbus, O.
(See page 119.)

CORBIN Screw Corp., New Britain, Conn.
(See page 831.)

FALLS Rivet Co., Kent, O.

GASKET Supply Co., 1729 Ludlow St., Philadelphia, Pa.
(See pages 765 and 795.)

HOEFELD & Co., R., Buffalo, N. Y.

HUBBARD Spring Mfg. Co., Pontiac, Mich.
(See page 679.)

IRELAND & Matthews Mfg. Co., 51-79 Iron St., Detroit, Mich.

KANSAS City Bolt & Nut Co. (Sheffield Station), Kansas City, Mo.

McKINNEY Mfg. Co., Pittsburg, N. S., Pa.

NEW England Bolt & Steel Co., Bowdoin St., (Everett), Boston, Mass.

PITTSBURG Screw & Bolt Co., Preble Ave. (N. S.), Pittsburg, Pa.

PLYMOUTH Mills, Plymouth, Mass.

QUADRIGA Mfg. Co., 213-21 W. Grand Ave., Chicago, Ill.

RELIANCE Mfg. Co., Massillon, O.
(See page 347.)

REPUBLIC Iron & Steel Co., Republic Bldg., Youngstown, O.

SESSIONS & Son, J. H., Bristol, Conn.

SMITH Co., Thomas, 18 Cypress St., Worcester, Mass.

STANLEY Works, New Britain, Conn.
(See page 269.)

STEELE & Johnson Mfg. Co., 779 S. Main St. Waterbury, Conn.

UPSON Nut Co., Unionville, Conn.

WROUGHT Washer Mfg. Co., S. Bay & Reynolds Sts., Milwaukee, Wis.

LEATHER WASHERS

ALGCO—See Auburn Leather Goods Co.

AUBURN Leather Goods Co., Auburn, N. Y. "Algco."
(See page 309.)

BRACE Leather Goods Co., 22 Wayne St., Pontiac, Mich.

CHICAGO Rawhide Co., 1301 Elston Ave., Chicago, Ill.

DETROIT Leather Specialty Co., 275 Beecher Ave., Detroit, Mich.

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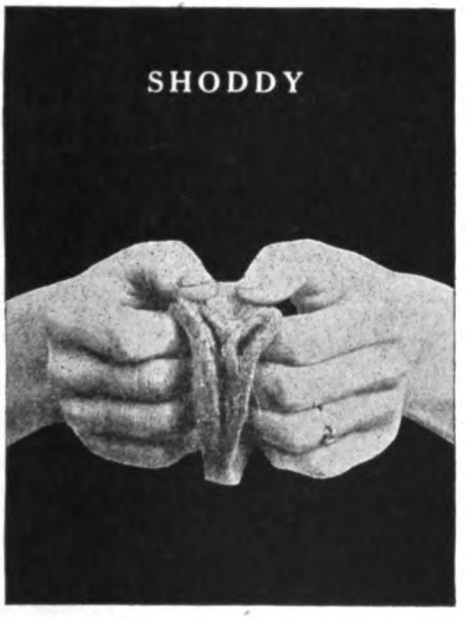
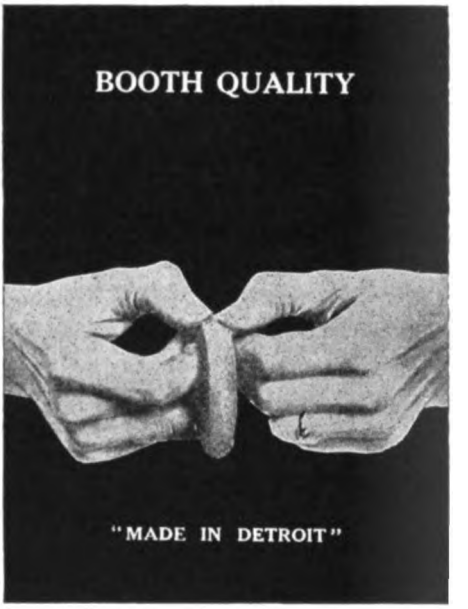
Booth

Trade Mark

FELT

WASHERS—GASKETS—STRIPS





The Quality of BOOTH FELT WASHERS, GASKETS and STRIPS and the appeal this quality has made to automobile manufacturers has built up a tremendous demand—a demand that could not be taken care of by any concern except the one which has specialized upon economical and efficient production.

Wherever on an automobile an oil tight or a dust proofing retainer is required—one that will keep its shape and stand up to its work long and well, there is where BOOTH FELT WASHERS are used, for nothing else has been found capable or applicable.

BOOTH Quality made its impression from the start—demonstrated superior service and actual economy in every case and in competition with other makes of felt.

Nothing for automobile uses approaches BOOTH FELT.

May we submit samples and figure on your requirements?

THE BOOTH FELT COMPANY, Inc.

DETROIT, MICH.

BROOKLYN, N. Y. **CHICAGO, ILL.**

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WASHERS (Continued)

LEATHER WASHERS (Continued)

DUCKWALL Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind.
(See page 409.)

G & K—See Graton & Knight Mfg. Co.

GRATON & Knight Mfg. Co., Worcester, Mass. "G & K."
(See page 103.)

HOEFELD & Co., R., 61-69 Carroll St., Buffalo, N. Y.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y.
(See pages 415 and 799.)

KENDRICK Valve & Washer Co., 318 E. Water St., Syracuse, N. Y.

MARSH Co., Charles W., Muskegon, Mich.

SUTHERLAND Co., F. L., 189 Beaubien St., Detroit, Mich.
(See page 813.)

LOCK WASHERS

(See Nuts, Lock)

STEEL SPRING WASHERS

BARNES Co., Wallace, Wallace & Parallel Sts., Bristol, Conn.

HOBBS Mfg. Co., Worcester, Mass.

TIRE PUMP CONNECTION WASHER

ROMORT Mfg. Co., 1810 Westlake Ave., Seattle, Wash.
(See page 450.)

VEHICLE WASHERS

BINKS—See Star Brass Works.

BURKE—See Superior Brass Mfg. Co.

CATARACT Auto-Vehicle Washer Co., Topeka, Kans.

CLOOS—See Imperial Valve Co.

EDGAR Mfg. Co., 104 Hanover St., Boston, Mass. "Rotobrush."

EVERREADY—See Smith Mfg. Co.

FEDERAL—See Walworth Mfg. Co.

FULLER Brush Co., 74 Union Pl., Hartford, Conn.

GAYLORD Sanitary Mfg. Co., 561 Main St., E., Rochester, N. Y.

HICKS Brush Co., Howard A., 826 18th St., Denver, Colo.

HYGENIA Brush Co., 16 Harding St., Worcester, Mass. "Autospra."

IMPERIAL Valve Co., 347 Holton St., Milwaukee, Wis. "Cloos."

IRVING—See Smith Mfg. Co.

MONITOR—See Rhodes Mfg. Co.

MULLER, Edward, 1304 John St., West New York, N. J. "Reliable."
(Se page 567.)

PEERLESS—See Tempco Mfg. Co.

PEORIA Overhead Vehicle Washer Co., Jefferson Bldg., Peoria, Ill.

PERFECTION—See Ryan & Long.

RELIABLE—See Muller, Edward.

RHODES—See Vehical Specialty Co.

RHODES Mfg. Co., 32 Union Pl., Hartford, Conn. "Monitor."

ROTOBRUSH—See Edgar Mfg. Co.

RYAN & Long, 586 Oneida St., Appleton, Wis. "Perfection."
(See page 567.)

SANITAX Brush Co., 2333 S. Wabash Ave., Chicago, Ill.

SMITH Mfg. Co., I. J., 1007 Ave. Q., Brooklyn, N. Y. "Irving," "Everready."

SMITH & Co., Jos. N., Detroit, Mich.
(See page 227.)

STAR Brass Works, 319 N. Albany Ave., Chicago, Ill. "Binks."

SUPERIOR Brass Mfg. Co., 106 S. Eighth St., St. Louis, Mo. "Burke."

TEMPCO Mfg. Co., 740 W. Van Buren St., Chicago, Ill. "Peerless."
(See page 567.)

UNIVERSAL—See Utilities Equipment Co.

UTILITIES Equipment Co., 185 Devonshire St., Boston, Mass. "Universal."

VEHICLE Specialty Co., 26 State St., Hartford, Conn. "Rhodes."

WALWORTH Mfg. Co., Boston, Mass. "Federal."

WASTE

COTTON WASTE

AMERICAN Manufacturers Supply Co., 297-99 Orleans St., Detroit, Mich.

ARBELLA Waste Co., 1210 Dorchester Ave., Boston, Mass.

BISHOP Mfg. Co., Robert (S. Boston), Boston, Mass.

BLAKELEY & Son, John, 1089 Germantown Ave., Philadelphia, Pa.

CHICAGO Sanitary Rag Co., 2137-43 S. Loomis St., Chicago, Ill.

EGAN Waste Co., 19 Burling Slip, New York, N. Y.

ESTES Mills, Fall River, Mass.

FIDELITY—See Hagy Waste Works.

FULTON Bag & Cotton Mills, Atlanta, Ga.

GROSS & Co., E., 95 Commerce St., Hartford, Conn.

HAGY & Son, Clayton L., 16th & Carpenter Sts., Philadelphia, Pa.

HAGY Waste Works, J. Milton, 836-42 Swanson St., Philadelphia, Pa. "Fidelity."

HOFFMAN-CORR Mfg. Co., 594 Broadway, New York, N. Y.

INTERWOVEN Mills, Martinsburg, W. Va.

LILLIE Co., Dexter P., Indian Orchard, Mass.

MASSASOIT Mfg. Co., Fall River, Mass.

MILL Remnants Co., 30 West St., New York, N. Y.

RIVERSIDE Mills, Kollock & Tatnall Sts., Augusta, Ga.

ROWACO—See Royal Textile Co.

ROYAL Mfg. Co., 30 E. Grand St., Rahway, N. J.

ROYAL Textile Co., 200 Congress St., Boston, Mass. "Rowaco."

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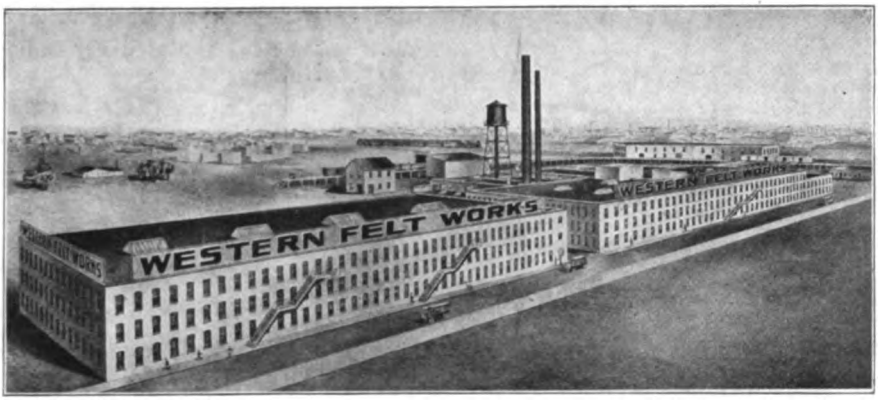
FELT WASHERS



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"WE MAKE THE FELT"

FELT WASHERS GASKETS STRIPS WICKS

FELT for Squeak Prevention, Lining Radiator Covers and for all other needs of the Automobile and Accessory Trades.

Immediate deliveries—because we have the capacity and equipment.

Quality of product—Deliveries and the fact that when buying direct from us middlemen's profits and delays are eliminated have enabled us to get the business of practically all the leading manufacturers.

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WASTE (Continued)

COTTON WASTE (Continued)

SNOW DRIFT—See Sweetland Waste Co.

SOUTH Atlantic Waste Co., Charlotte, N. C.

SPRINGFIELD Waste Co., Mill St., Springfield, Mass.

STANDARD Waste Mfg. Co., 2306-10 N. American St., Philadelphia, Pa.

SWEETLAND Waste Co. (S. Boston), Boston, Mass. "Snow Drift."

TRAVERS Twine & Cordage Co., 31 Warren St., New York, N. Y.

UNION Wadding Co., Pawtucket, R. I.

WATCHES

LIMOUSINE WATCHES

WALTHAM Watch Co., Waltham, Mass. (See page 161.)

WEBBING

JUTE WEBBING

AMERICAN Mills Co. of New York, 395 Broadway, New York, N. Y. (See page 321.)

BUFFALO Weaving & Belting Co., 234 Chandler St., Buffalo, N. Y.

HOPE Webbing Co., Providence, R. I.

LANDERS Bros. Co., Dept. A2, Toledo, O. (See page 351.)

LUDLOW Mfg. Associates, Boston, Mass.

MODERN Belt & Web Co., Piper Bldg., Baltimore, Md.

SUSQUEHANNA Webbing Co., Bloomsburg, Pa.

WELDING

AUTOGENOUS WELDING

ADMIRAL Welding Machine Co., 1331 Walnut St., Kansas City, Mo.

ADVANCE Welding Machine Co., 111 N. Desplaines St., Chicago, Ill.

AKRON Welding Co., Sweitzer Ave. & Crosier St., Akron, O.

AMERICAN Welding Co., 2724 Michigan Ave., Chicago, Ill.

AMERICAN Welding & Auto Repair Co., 23d & Olive Sts., St. Louis, Mo.

ATLAS Welding Works, 2424 Elizabeth Ave., Rahway, N. J.

ATLAS Welding & Supply Co., 2330 Penn Ave., Pittsburgh, Pa.

BIRMINGHAM Welding & Machinery Co., 118 S. 22d St., Birmingham, Ala.

BIZIER Welding & Cutting Co., 196 11th Ave., New York, N. Y.

BOSSERT Co., Utica, N. Y. (See page 279.)

BOURNONVILLE Welding Co., Eug., 241-45 W. 64th St., New York, N. Y.

BRAZING & Welding Co., 1615 Wabash Ave., Chicago, Ill.

BROOKLYN Welding Co., 29 York St., Brooklyn, N. Y.

BUSCH-HARTMAN Co., 716 Golden Gate Ave., San Francisco, Cal.

CAMBRIDGE Welding Works, 51 Ames St., Cambridge, Mass.

CAPITOL Welding Co., 45-47 Sabin St., Providence, R. I.

CAVE Welding Co., 32 Liberty St., Springfield, Mass.

CHAMPION Welding & Mfg. Co., 398 Washington St., Buffalo, N. Y.

COLUMBUS Welding Shop, 294-96 N. Third St., Columbus, O.

CROSBY Co., Buffalo, N. Y. (See page 699.)

DAVIS Sewing Machine Co., Linden & Davis Sts., Dayton, O.

DELCAMPE Welding Co., 1517 Wood Ave., Bridgeport, Conn.

DES MOINES Welding Co., 117-19 Grand Ave., Des Moines, Ia.

DETROIT Welding Specialty Co., 96 Beaubien St., Detroit, Mich.

DYER Co., G. H., 155 Brookline St., Cambridge, Mass.

ELLINGER Mfg. Co., Walter, 327 Pennsylvania Ave., Sheboygan, Wis.

GENERAL Welding Co., 355-57 14th St., Hoboken, N. J.

GIBBS Welding Co., 12th & Locust Sts., Des Moines, Ia.

GREAT Lakes Welding Co., 937-45 West St., Cleveland, O.

HAUCK Mfg. Co., 140 Livingston St., Brooklyn, N. Y.

HAVENS Bros. Mfg. & Supply Co., 1622 Wazee St., Denver, Colo.

HERCULES Welding & Machine Co., 223-25 N. 16th St., Philadelphia, Pa.

HOBBIE Welding Plant, Hampton, Ia.

HUB Machine, Welding & Contracting Co., 22d & Race Sts., Philadelphia, Pa.

JACOBS Co., F. L., 449-53 Gusin St., Detroit, Mich. (See page 329.)

JOHNSON Welding & Auto Repair Co., 1302 S. Wabash Ave., Chicago, Ill.

K. G. WELDING & Cutting Co., 556 W. 34th St., New York, N. Y.

LACLEDE Iron Works, 1315 Chestnut St., St. Louis, Mo.

LAWRENCE & Co., L., 292 Halsey St., Newark, N. J. (See page 799.)

MANUFACTURERS Welding Co., 740 Jamaica Ave., Brooklyn, N. Y.

MESSER & Co., 121 N. Seventh St., Philadelphia, Pa.

METAL Welding & Supply Co., 309-11 Broadway, Denver, Colo.

METALS Welding Co., 4400 Perkins Ave., Cleveland, O.

NATIONAL Welding Co., 326-28 Dixwell Ave., New Haven, Conn.

NATIONAL Welding Co., Morris Ave. & Dickerson St., Newark, N. J.

Complete Index to Classification appears on Pages 8 to 27.

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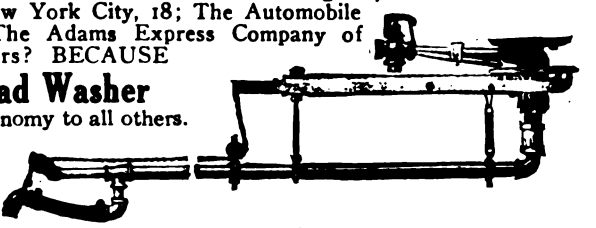
WHY IS IT that the Automobile Club of America has installed 50 Muller Overhead Washers in their headquarters on West 54th Street, also same style Washers were installed in their new building at 72d Street and East River, The Jumel Garage, New York City, 18; The Automobile Club of Philadelphia, 12; The Adams Express Company of Jersey City, 4 and 1000 of others? BECAUSE

The Muller Overhead Washer

is superior in efficiency and economy to all others.



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1304 John St., North Bergen, West New York P. O., N. J.

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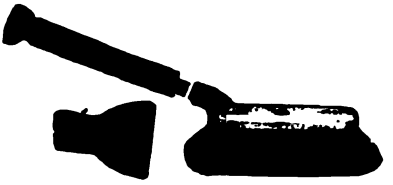
Dust Rings for Hubs. Strips for Crank Cases. Felt Washers and Gaskets for all lubricating and dust excluding purposes. Felts for the Automobile and Machinery Trade a specialty.

No order too small to receive prompt and most careful attention.

TEMPCO
Self-Cleaning Auto Washer Is Better Than Sponges



Every drop of water that comes through the handle of the TEMPCO Self-Cleaning Auto Washer goes where it's needed. No wasteful dribbling—as there is from every sponge new or old—and no streaks you have to go over.

TEMPCO Auto Washer washes your car clean, without hard rubbing. The force of the water displaces "elbow grease," so evident when you wash the car with a sponge. Will not smear or streak the dirt. Velvety Chinese bristles cannot scratch highest polish. Strong enough to clean the dirtiest truck.

For use on every part of your car, from body to wheels. Mud scraper included for use under fenders. Price complete, $3.50.

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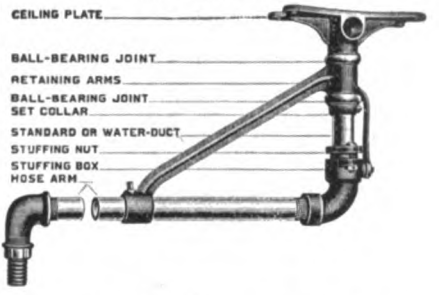
THE "PERFECTION" AUTO WASHER

"Built on honor"



Strong, Swings freely on Ball Bearings, Absolutely Watertight.

These Washers are constantly being sold to Jobbers who have bought them for the past 12 years.

	List
No. 1—4½ ft. arm	$12.00
No. 2—6 ft. arm with turnbuckle brace	14.00

Big Discount to Jobbers

RYAN & LONG
586 Oneida Street, Appleton, Wis.

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WELDING (Continued)

AUTOGENOUS WELDING (Continued)

NATIONAL Welding & Mfg. Co., 1418-30 Niagara St., Buffalo, N. Y.

OHIO Welding & Mfg. Co., 828-30 W. Sixth St., Cincinnati, O.

OREGON Welding & Mfg. Co., 805 Glisan St., Portland, Ore.

OXY-ACETYLENE Welding Co., 1921 Grand Ave., Kansas City, Mo.

OXY-ACETYLENE Welding & Machine Co., 1818 Webster Ave., New York, N. Y.

OXY-CARBI Co., New Haven, Conn.

OXYGEN Welding & Brazing Co., 152 W. Sixth St., St. Paul, Minn.

PACIFIC Coast Welding Co., 610 E. Pike St., Seattle, Wash.

PEERLESS Welding Co., 25 Stanhope St., Boston, Mass.

PEERLESS Welding Co., 505 W. 45th St., New York, N. Y.

PIONEER Welding Co., 610 E. Main St., Kalamazoo, Mich.

PITTSBURGH Reinforced Brazing & Machine Co., 2525 Liberty Ave., Pittsburg, Pa.

POWELL-ELLIOTT Auto Repair Co., 143 Rogers Ave., Brooklyn, N. Y.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind.
(See page 553.)

R. I. Welding & Sherardizing Co., Promenade & Park Sts., Providence, R. I.

S. & M. Welding Co., 1831-33 E. 55th St., Cleveland, O.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SCHAAP Automobile Co., 344 Cumberland St., Brooklyn, N. Y.

SCHEMMEL Welding Machine Works, Wapakoneta, O.
(See page 825.)

SMITH & Co., W. R., 804-06 W. 52d St., New York, N. Y.

SORENSON, C., 18 E. 16th St., Chicago, Ill.

STERLING Engine Co., 331 S. Clinton St., Chicago, Ill.

SUPERIOR Welding & Machine Co., 700 Canal St., Stamford, Conn.

TRAGESER Steam Copper Works, John, 447-57 W. 26th St., New York, N. Y.

TWIN City Welding Co., 313 Seventh Ave., S., Minneapolis, Minn.

UNITED Welding & Mfg. Co., Vernon & Nott Aves., Long Island City, N. Y.

VILTER Mfg. Co., 918 Clinton St., Milwaukee, Wis.

VULCAN Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.

WATERBURY Welding Co., 1147 South St., Waterbury, Conn.
(See page 805.)

WATERHOUSE Welding Co., 15 Pelham St., Boston, Mass.

WELDRITE Co., 350 Jackson Ave., Long Island City, N. Y.

WESTERN Drop Forge Co., Marion, Ind.
(See page 821.)

WESTERN Fixture Co., 573-75 E. Water St., Milwaukee, Wis.

WILKES-BARRE Welding Co., 6 W. Ross St., Wilkes-Barre, Pa.

WORCESTER Pressed Steel Co., Worcester, Mass.
(See page 213.)

ELECTRIC WELDING

AKRON-SELLE Co., High & Chestnut Sts., Akron, O.

BECKLEY Perforating Co., C. R. R. Ave., Garwood, N. J.

BILLINGS & Spencer Co., Hartford, Conn.

CINCINNATI Ball Crank Co., Cincinnati, O.
(See page 183.)

DETROIT Electric Welder Co., 255 Lafayette Ave., W., Detroit, Mich.

JACOBS Co., F. L., 449-53 Guoin St., Detroit, Mich.
(See page 329.)

LEWIS Electric Welding & Mfg. Co., 4036 Detroit Ave., Toledo, O.
(See page 549.)

McDOWELL Mfg. Co., 541 Wood St., Pittsburg, Pa.

MICHIGAN Electric Welding Co., Detroit, Mich.
(See page 297.)

OAKES Pressed Steel Co., Indianapolis, Ind.

PIONEER—See Thomson Electric Welding Co.

STANDARD Welding Co., Cleveland, O.
(See Book Mark.)

STEEL Products Co., Cleveland, O.
(See page 296.)

THOMSON Electric Welding Co., 161 Pleasant St., Lynn, Mass. "Pioneer."

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

WORCESTER Pressed Steel Co. (Barbers Crossing), Worcester, Mass.

WHEELS

CAST STEEL WHEELS

BUCHANAN Electric Steel Co., Buchanan, Mich.

DAYTON Steel Foundry Co., Chapel Rd. & C. H. & D. R. R., Dayton, O.

JOHNSON Steel Wheel Corp., 30 Kemble St., Boston, Mass.

MICHIGAN Steel Casting Co., Detroit, Mich.
(See page 151.)

OTIS Elevator Co., 11th Ave. & 26th St., New York, N. Y.

SMITH Wheel, Syracuse, N. Y.

WEST Steel Casting Co., 805-13 E. 70th St., Cleveland, O.

FIFTH WHEELS

(For applying to the rear deck of the car so that trailer can be mounted)

MARTIN Rocking Fifth Wheel Co., 244 Main St., Springfield, Mass.

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can be installed in less than twenty minutes on any car equipped with starting or lighting system. Consumes very little current—the surplus generated by a Ford Magneto is ample for the Ford Warm Hand Wheel.

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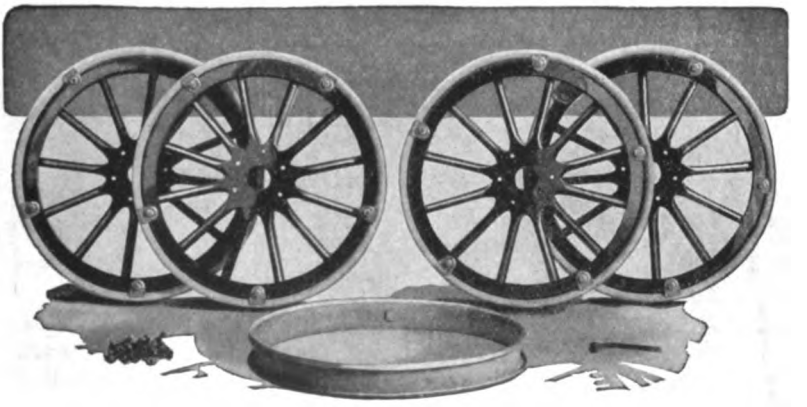
The New No. 75 Demountable Rims on Wheels

For Small Cars



Write for our prices on this equipment. Also catalog of all parts pertaining to automobile wheels. Special service department opened to take care of orders for Kelsey Demountable Rims.

Service Department

KELSEY WHEEL CO. DETROIT, MICH.

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WHEELS (Continued)

PRESSED AND WROUGHT STEEL WHEELS

BUCHANAN Electric Steel Co., Buchanan, Mich.

FRENCH & Hecht, Third & Farnum Sts., Davenport, Ia.

HYDRAULIC Pressed Steel Co., 3180 E. 61st St., Cleveland, O. "Parker-Hydraulic."
(See pages 229 and 230.)

PARKER-HYDRAULIC—See Hydraulic Pressed Steel Co.

REPAIRING OF WHEELS

CHICAGO Wheel & Rim Co., 1550 Indiana Ave., Chicago, Ill.
(See page 869.)

SPECIAL PNEUMATIC, SPRING AND EMERGENCY WHEELS

AERINAX—See Elastic Wheel Co.

AMERICAN Motor Wheel Co., Ben Hur Bldg., Crawfordsville, Ind. "Coats."

AUTOMOBILE Spring Wheel Co., 413 W. Broadway, New York, N. Y. "Sipe."

COATS—See American Motor Wheel Co.

DURGIN Auto Wheel Co., Lawrence National Bank Bldg., Lawrence, Kans. "Modlin."

ELASTIC Wheel Co., 328 Chestnut St., Philadelphia, Pa. "Aerinax."

GRAY Bros., Chicago, Ill.

HUB Shock Absorber Wheel Co., Lancaster, Pa.

J. B. D. Resilient Wheel Mfg. Co., 673 Smith St., Milwaukee, Wis.

JENKINS Emergency Wheel Co., Mutual Bldg., Richmond, Va.

LEIB Auto Wheel Co., 105 McKinley Ave., Middletown, O.

MATHIESON Spring Cushion Wheel Co., 233 W. Grand Ave., Chicago, Ill.

MODLIN—See Durgin Auto Wheel Co.

PECK Wheel Co., 2121 Michigan Ave., Chicago, Ill.

SCHICK Wheel & Tire Co., 89 Indiana Ave., Wheeling, W. Va.

SEWELL Cushion Wheel Co., Gratiot Ave. & Beaufait St., Detroit, Mich.

SIPE—See Automobile Spring Wheel Co.

T. S. Wheel & Mfg. Co., 245 Oregon St., Milwaukee, Wis.

TICHENOR Spring Wheel Co., Saratoga, Wyo.

URIE, W. T., Independence, Mo.

WILSON Tire & Rubber Co., Springfield, Ill.
(See page 857.)

STEERING WHEELS

AMERICAN Wood Rim Co., Onaway, Mich.

BECCO—See Michigan Motor Specialties Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

KUNDTZ Co., Theodor, Elm & Winslow Sts., Cleveland, O.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

NEVILLE Steering Wheel & Mfg. Co., 74 Congress St., W., Detroit, Mich.

PERFECTION—See Prosser Engineering Co.

PROSSER Engineering Co., 2100 W. Superior Ave., Cleveland, O. "Perfection."

TUCKER Wood Work Co., Sidney, O.

VINCENT Clear Room Steering Wheel Co., 498 Bewick Ave., Detroit, Mich.

HEATED STEERING WHEELS

ELECTRIC Heating Element Co., South & Franklin Sts., Minneapolis, Minn. "Electro-grips."

ELECTROGRIPS—See Electric Heating Element Co.

IECO STEERWARMS—See Interstate Electric Co.

INTERSTATE Electric Co., Baronne & Perdido Sts., New Orleans, La. "Ieco Steerwarms."

WARM Hand Steering Wheel Corp., Poughkeepsie, N. Y.
(See page 569.)

WIRE WHEELS

CRAFTSMEN Motor Corporation, 2815-19 S. Wabash Ave., Chicago, Ill. "Kelly."
(See page 573.)

F. & H. Wire Wheel Co., Springfield, O.

G. R. C.—See General Rim Co.

GENERAL Rim Co., St. Marys, Pa. "G. R. C."

GREAT Western Mfg. Co., Laporte, Ind. "Lindsay."

HAYES Wheel Co., Jackson, Mich.

HOUK Mfg. Co., 1700 Elmwood Ave., Buffalo, N. Y.

KELLY—See Craftsmen Motor Corporation.

LINDSAY—See Great Western Mfg. Co.

MOTT Wheel Works, Utica, N. Y.
(See page 497.)

RUDGE-WHITWORTH—See Standard Roller Bearing Co.

SPRANGER Wheel & Rim Co., 139 Beaubien St., Detroit, Mich.

STANDARD Roller Bearing Co., 50th St. & Lancaster Ave., Philadelphia, Pa. "Rudge-Whitworth."

STANDARD Welding Co., Cleveland, O. "Stanweld."
(See Book Mark.)

STANWELD—See Standard Welding Co.

UNIVERSAL Welding Co., St. Anne, Ill.

WHITESIDE Wheel Co., Canal & Tenth Sts., Indianapolis, Ind.

WOOD WHEELS

ACORN—See Crane & MacMahon.

ARCHIBALD Wheel Co., 150 West St., Lawrence, Mass.

AUBURN Wheel & Mfg. Co., Auburn, R. I.

AUTO Wheel Co., Lansing, Mich.

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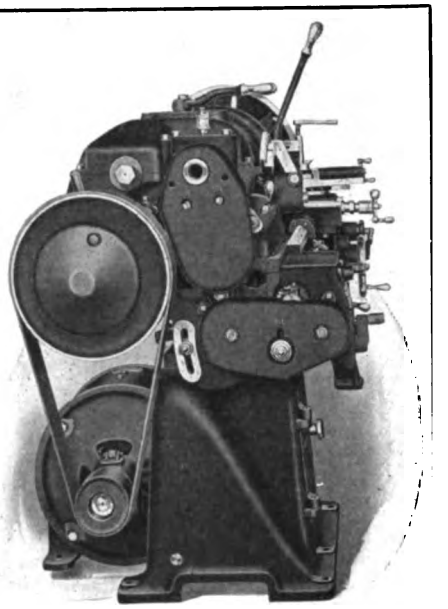

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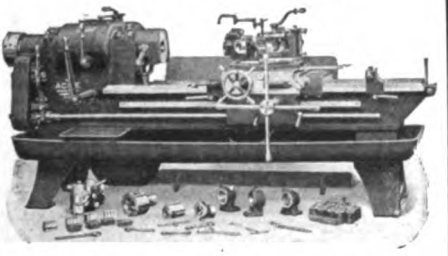
CINCINNATI ACME

Flat Turret Lathes, Screw Machines, Turret Lathes, Brass Working Machines, Universal Turret Lathes, and all Tool Accessories



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The Universal for Handling Job Lots of Small Work

While this new five-spindle screw machine shows up particularly well on job lots, they are not the only work it handles efficiently.

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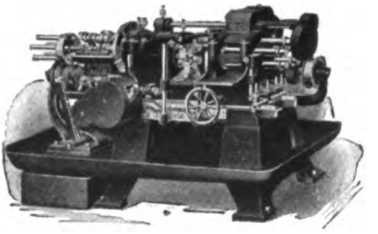
Full Automatic Screw Machine



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Cincinnati Automatic Machine Co.

Oakley, Cincinnati, O.

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WHEELS (Continued)

WOOD WHEELS (Continued)

BALTIMORE Hub Wheel & Mfg. Co., Harford Rd. & B. & O. R. R., Baltimore, Md.

BIMEL Spoke & Auto Wheel Co., Portland, Ind.
(See page 791.)

CENTRAL City Wheel Works, Plum & Willkinson Sts., Syracuse, N. Y.

CRANE & MacMahon, St. Marys, O. "Acorn," "Hickory Nut."
(See page 569.)

EAMES & Co., A. M., Framingham, Mass.

EBERLY & Orris Mfg. Co., Mechanicsburg, Pa.

EMPIRE Wheel Works, 610 South St., Utica, N. Y.

HARRIS Co., 7 Northampton St., Easthampton, Mass.

HAYES Motor Truck Wheel Co., St. Johns, Mich.

HAYES Wheel Co., Jackson, Mich.

HICKORY NUT—See Crane & MacMahon.

HOOPES, Bro. & Darlington, West Chester, Pa.

JONES & Co., Phineas, Newark, N. J.
(See page 681.)

KELSEY Wheel Co., Detroit, Mich.
(See page 569.)

KUNDTZ Co., Theodor, Elm & Winslow Sts., Cleveland, O.

MEEKER Mfg. Co., Linden & Huffman Aves., Dayton, O.

MILLAR Wheel Works, 2111 S. Wabash Ave., Chicago, Ill.

PRUDDEN & Co., W. K., 701 May St., Lansing, Mich.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

SCHWARZ Wheel Co., (Frankford), Philadelphia, Pa.

SIMPLICITY Demountable Wheel Co., 425 Bond Ave., N. W., Grand Rapids, Mich.
(See page 613.)

STANDARD Wheel Co., Terre Haute, Ind.

WAVERLY Co., 129 S. East St., Indianapolis, Ind.

WAYNE Wheel Co., Newark, N. Y.
(See page 855.)

WHEEL & Wood Bending Co., 141 John St Bridgeport, Conn.

WHIPCORD

UPHOLSTERY WHIPCORD

AMERICAN Mills Co., 17th St. & Fourth Ave., New York, N. Y.

ROY Woolen Co., Watervliet, N. Y.

WATERLOO Woolen Mfg. Co., Waterloo, N. Y.

WHISTLES

EXHAUST WHISTLES

(See Horns, Exhaust)

WICKING

CANDLE WICKING

BISHOP Mfg. Co., Robert (S. Boston), Boston, Mass.

ESTES Mills, Fall River, Mass. "Sterling."

HOFFMAN-CORR Mfg. Co., 594 Broadway, New York, N. Y.

LEES Mfg. So., 320 Broadway, New York, N. Y.

MASSASOIT Mfg. Co., Fall River, Mass.

STERLING—See Estes Mills.

WESTPORT Mfg. Co., Fall River, Mass.

FELT LUBRICATOR WICKING

BOOTH Felt Co., Detroit, Mich.
(See page 563.)

BRAWLEY, T. R., 85-87 Adams St., Brooklyn, N. Y.
(See page 567.)

WESTERN Felt Works, 4115-33 Ogden Ave., Chicago, Ill.
(See page 565.)

WICKS

LAMP WICKS

CONSOLIDATED Duck Co., 86 Worth St., New York, N. Y.

LEES Mfg. Co., 320 Broadway, New York, N. Y.

WINCHES

CAR EXTRACTING WINCHES AND BLOCKS

(Device for pulling cars out of the mud or sand)

AUTO Draft Co., Lake City, Minn.

CAR Puller Co., Ladysmith, Wis.

GIANT Cable Hoist Co., Cleveland, O. "Pullifter."
(See page 677.)

KEEPERS, J. C., Olathe, Kans.

PILLSBURY Mfg. Co., 322 Hennepin Ave., Minneapolis, Minn.
(See page 573.)

PULL-U-OUT Mfg. Co., 5611 Delmar Ave., St. Louis, Mo.

PULLIFTER—See Giant Cable Hoist Co.

ROSE Bros., Beaumont, Neb.
(See page 573.)

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WIRE WHEELS

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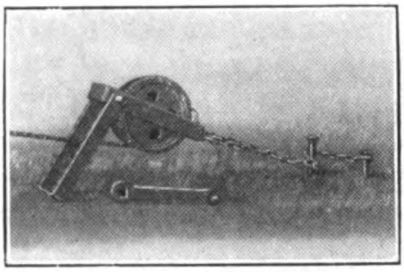

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THE ROSE AUTO PULLER

will pull a car—big or little—out of mudholes, sand, ditches or other bad predicaments.

It is perfectly simple—no block and tackle arrangement—no confusion of ropes to entangle.

Small and compact—it can be carried in tool box, always ready for service.

Price $7.50

Sold on guarantee of satisfaction or money returned.

ROSE BROS., Rosemont, Nebraska

PILLSBURY TRADE MARK AUTOPUL

Has been **thoroughly tried out, under all conditions** with trucks, touring cars, and roadsters.

It has been found **satisfactory** in **every instance.**

It enables an automobile stuck in **mud, sand** or **snow,** to pull out with its own power.

The manner of doing this is **simplicity itself,** and the necessary **equipment** is small and easily carried under the car seat. **No tools necessary** to attach it.

Your customers will buy on sight and send their friends for more.

Write for large illustrated folder and our exclusive agency proposition and testimony of actual users which prove more than we claim.

List $10—30% off to dealers on single orders.

Exceptionally attractive discount on larger orders.

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WINDOWS

WIND SHIELD WINDOWS

CAPITOL Wind Shield Device Co., 355 Trumbull St., Hartford, Conn. (See page 697.)

WIPERS

WIPERS AND POLISHING CLOTHS

(For Cotton Waste—See Waste, Cotton)

AMERICAN Manufacturers Supply Co., 297-99 Orleans St., Detroit, Mich.

AMERICAN Mill Ends Co., 27 Woodward Ave., Detroit, Mich.

ARBELLA Waste Co., 1310 Dorchester Ave., Boston, Mass.

CADILLAC Paper Co., E. Grand Blvd. & Hastings St., Detroit, Mich.

CHICAGO Sanitary Rag Co., 2137-43 S. Loomis St., Chicago, Ill.

CONSUMERS Paper Co., Detroit, Mich.

DETROIT Sanitary Rag Co., 24 E. Atwater St., Detroit, Mich.

DONT-MA—See Hoffman-Corr Mfg. Co.

FULTON Bag & Cotton Mills, Atlanta, Ga.

GROSS & Co., E., 95 Commerce St., Hartford, Conn.

HAGY Waste Works, J. Milton, 886-42 Swanson St., Philadelphia, Pa.

HAGY & Son, Clayton L., 16th & Carpenter Sts., Philadelphia, Pa.

HOFFMAN-CORR Mfg. Co., 594 Broadway, New York, N. Y. "Dont-Ma."

LOUISVILLE Sanitary Wipers Co., Louisville, Ky.

LYMAN Co., John R., 119 Liberty St., Springfield, Mass.

MILL Remnants Co., 80 West St., New York, N. Y. "Mireco."

MIRECO—See Mill Remnants Co.

NORTH & Son, Jos. W., Sixth St., Elizabeth, N. J.

NORTHWESTERN Sanitary Wiping Rag Co., 1015 Holden St., Chicago, Ill.

REACH Textile Co., A. L., 128 Pearl St., Boston, Mass.

ROBINSON & Sons, D., 136-38 Napoleon St., Detroit, Mich.

STANDARD Waste Mfg. Co., 2306-10 N. American St., Philadelphia, Pa.

WIRE

BOWDEN WIRE

BEARINGS Co. of America, 250 W. 54th St., New York, N. Y. (Importers.) (See page 115.)

INSULATED WIRE

AMERICAN Electrical Works, Phillipsdale, R. I.

AMERICAN Steel & Wire Co., Chicago, Ill. "Amerite," "Americore." (See page 575.)

AMERICORE—See American Steel & Wire Co.

AMERITE—See American Steel & Wire Co.

ATLANTIC Insulated Wire & Cable Co., 120 Liberty St., New York, N. Y.

B. I. W.—See Boston Insulated Wire & Cable Co.

BISHOP Gutta-Percha Co., 420 E. 25th St., New York, N. Y. (See page 575.)

BOSTON Insulated Wire & Cable Co., Boston, Mass. "B. I. W." (See page 689.)

BOURN Rubber Co., 58 Warren St., Providence, R. I. "Star."

CRESCENT Insulated Wire & Cable Co., Olden Ave. & Taylor St., Trenton, N. J.

EAGLE—See Marion Insulated Wire & Rubber Co.

EMPIRE Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

GENERAL Electric Co., Schenectady, N. Y.

GOODRICH Co., B. F., Akron, O.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "Red Rib." (See page 829.)

HABIRSHAW Wire Co., 1 Madison Ave., New York, N. Y.

HAZARD Mfg. Co., 81 E. Ross St., Wilkes-Barre, Pa.

INDIANA Rubber & Insulated Wire Co., Jonesboro, Ind. "Paranite," "Peerless." (See page 523.)

KERITE Insulated Wire & Cable Co., 30 Church St., New York, N. Y.

MARION Insulated Wire & Rubber Co., Eighth St., & Big Four Ry., Marion, Ind. "Eagle."

NATIONAL India Rubber Co., Bristol, R. I.

NEW York Insulated Wire Co., 114 Liberty St., New York, N. Y.

OKONITE Co., 258 Broadway, New York, N. Y.

PACKARD Electric Co., Warren, O.

PARANITE—See Indiana Rubber & Insulated Wire Co.

PEERLESS—See Indiana Rubber & Insulated Wire Co.

RED RIB—See Grossman Mfg. Co.

ROEBLINGS Sons Co., John A., Trenton, N. J.

ROME Wire Co., Railroad St., Rome, N. Y.

SAFETY Insulated Wire & Cable Co., 114 Liberty St., New York, N. Y.

SIMPLEX Wire & Cable Co., 201 Devonshire St., Boston, Mass.

STANDARD Underground Cable Co., Westinghouse Bldg., Pittsburg, Pa.

STAR—See Bourn Rubber Co.

Complete Index to Classification appears on Pages 8 to 27.

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RUBBER COVERED WIRE—IGNITION WIRE—LAMP CORD

and bare copper and insulated wires
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WORCESTER.....94 Grove Street
BOSTON.....120 Franklin Street
PHILADELPHIA.....Widener Building
PITTSBURGH.....Frick Building
BUFFALO.....337 Washington Street
DETROIT.....Foot of First Street
CINCINNATI.....Union Trust Building
CLEVELAND.....Western Reserve Building
BALTIMORE.....32 So. Charles Street
WILKESBARRE, PA....Miners Bank Building
ST. LOUIS.....3d National Bank Building
ST. PAUL-MINNEAPOLIS.Pioneer Bldg., St. Paul
OKLAHOMA CITY...State Natl. Bank Building
BIRMINGHAM, ALA.....Brown-Marx Building
DENVER.....1st National Bank Building
SALT LAKE CITY.....Walker Bank Building

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Pacific Coast Representative: U. S. Steel Products Company
San Francisco Los Angeles Portland Seattle

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WIRE (Continued)

PHOSPHOR BRONZE WIRE

AMERICAN Brass Co., (Benedict & Burnham Branch), Waterbury, Conn.

OMEGA—See Riverside Metal Co.

PHOSPHOR Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. (See page 331.)

RIVERSIDE Metal Co., Riverside, N. J. "Omega."

STEEL SPRING WIRE

AMERICAN Steel & Wire Co., Chicago, Ill. (See page 575.)

HELMUTH Co., L., 17 Battery Pl., New York, N. Y. (Importers.)

MORGAN Spring Co., Worcester, Mass.

NASH Co., George, 217 Pearl St. New York, N. Y. (Importers.) (See page 547.)

ROEBLINGS Sons Co., John A. Trenton, N. J.

SPENCER Wire Co., Worcester, Mass.

TRENTON Iron Co., Trenton, N. J.

WOOL

STEEL WOOL

AMERICAN Steel Wool Mfg. Co., 451 Greenwich St., New York, N. Y.

BUEHNE Steel Wool Co., 93 Nassau St., New York, N. Y.

RHODES & Co., J. H., 162 W. Kinzie St., Chicago, Ill.

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is easy when you use The Automobile Trade Directory right. Remember the listing is under the **noun** but the index to classification in the front of the book has cross references which will always help you out.

If you can't find what you want ask us and we will tell you. Our desire is to aid the buyer in finding what he needs when he needs it.

The Automobile Trade Directory
243-249 W. 39th St., New York

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Specialties for Ford Cars

PART III

Classified Lists of the Manufacturers of Accessories and Parts Applicable to the Ford Car

A complete Index to classification appears on pages 28 to 32

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THE FORD ENGINE MAY BE RUINED

—the cylinders and pistons scored—the bearings burned out etc., necessitating a large repair bill—unless the driver is ever watchful of his oiling system. Proper lubrication is vital. Practically ***every car except the Ford*** is factory equipped with a ***forced feed*** oiling system with a gauge on the dash, showing the oil flow. Ford owners will also be able to watch the oil supply from the seat at all times—if they install a

STRONG SIGHT FEED OILER FOR Fords

It gives the same freedom from worry and needless repair bills that other car owners enjoy. Saves over 50% on oil. The motor runs smoother, cooler, has more power, and lasts longer at less expense. Price only $5.00.

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Sold only through Dealers

Single lots $3.75 Half doz. lots $3.50 Dozen lots $3.33

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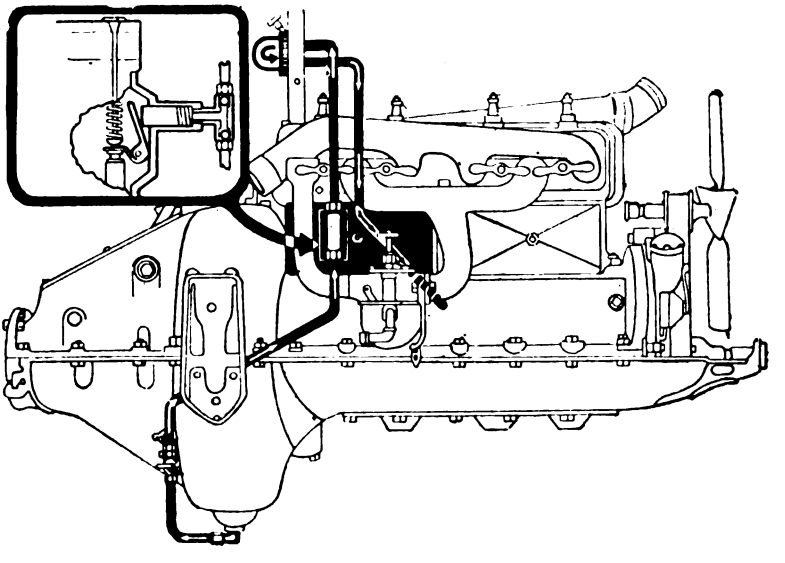
DES MOINES IOWA.



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Part III.

Specialties for Ford Cars

ACCELERATORS

FOOT ACCELERATORS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

B. L. B. Mfg. Co., 864 Woodward Ave., Detroit, Mich.

B. M. W.—See Geneseo Auto Supply Co.

BULL DOG—See Thomas Co.

C. M. C.—See Christensen Mfg. Co.

CHRISTENSEN Mfg. Co., C. M., Mapleton, Ia. "C. M. C."

COMFORT Motor Machine Co., 715 Galapago St., Denver, Colo. "Simplex."

CRUM-WILEY Mfg. Co., Peru, Ind.

DONLIN Auto Co., C. A., Hopkins, Mo.

EWALD Novelty Works, Oakfield, Wis.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GENESEO Auto Supply Co., Geneseo, Ill. "B. M. W."

"GO" Motor-Speeder Co., 165 Third Ave., Three Rivers, Mich. (See page 847.)

HACKNEY—See Roller Bearing Foot Pedal Co.

HEATON & Ault Mfg. Co., 6243 Greenwood Ave., Chicago, Ill.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

LINCOLN Machine Shops, Lincoln, Ill.

MASTER Foot Accelerator Co., H. W., Hellman Bldg., Los Angeles, Cal.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NIFTY—See Sapp, Will A.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. (See page 207.)

PRESTO—See R. & R. Mfg. Co.

R. & R. Mfg. Co., 144 S. Delaware St., Indianapolis, Ind. "Presto."

ROLLER Bearing Foot Pedal Co., Hackney Bldg., St. Paul, Minn. "Hackney."

SAPP, Will A., Elgin, Neb. "Nifty."

SIMPLEX—See Comfort Motor Machine Co.

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. (See page 653.)

THOMAS Co., W. H., Spencer, Ia. "Bull Dog."

UNIVERSAL Device Co., Three Rivers, Mich. (See page 797.)

VON WETTBERG, E. F., 1188 Main St., Bridgeport, Conn.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis.

WEBBER & Co., Philip H., Hoopeston, Ill. (See page 581.)

ADJUSTERS

FAN BELT ADJUSTERS

N. Y. Motor Car Device Co., 299 11th Ave., New York, N. Y. "Premo."

PREMO—See N. Y. Motor Car Device Co.

VALVE STEM ADJUSTERS

(See also Rods, Push)

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

EDELMANN & Co., 341-49 E. Ohio St., Chicago, Ill.

HOME Light Co., 3353 Milwaukee Ave., Chicago, Ill.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

P. & L.—See Parkhurst-Lavender Auto & Machine Co.

PARKHURST-LAVENDER Auto & Machine Co., Webster City, Ia. "P. & L."

PEERLESS Motor Specialty Co., 146 W. 52d St., New York, N. Y.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

ANTI-RATTLERS

BRAKE ROD CLEVIS ANTI-RATTLERS

(See also Supports, Brake Rod)

AFFA—See Graffam & Co.

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

GRAFFAM & Co., W. S., 85 Locust St., Northampton, Mass. "Affa."

HOOD ANTI-RATTLERS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

MUD GUARD ANTI-RATTLERS

(See Braces, Mud Guard)

Complete Index to Classification appears on Pages 28 to 32.

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ANTI-RATTLERS (Continued)

RADIUS ROD ANTI-RATTLERS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

CRUM-WILEY Mfg. Co., Peru, Ind.

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

SPARK AND THROTTLE ANTI-RATTLERS

AFFA—See Graffam & Co.

GRAFFAM & Co., W. S., 85 Locust St., Northampton, Mass. "Affa."

SPINDLE ARM ANTI-RATTLERS

ECLIPSE Machine Co., Elmira, N. Y. (See page 729.)

KING Specialty Mfg. Co., 200 Washington St., Brookline, Mass. (See page 599.)

SANBORN Mfg. Co., J. W., Hampstead, N. H.

STEERING COLUMN ANTI-RATTLERS

(See Braces, Steering Column)

STEERING ROD ANTI-RATTLERS

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

CRUM-WILEY Mfg. Co., Peru, Ind.

DACO—See Danver Accessory Co.

DANVER Accessory Co., Pawtucket, R. I. "Daco."

E. G.—See Grossman Mfg. Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

TOWLE Mfg. Co., Portland, Me.

UNIQUE Specialty Co., S. 17th St., Flushing, N. Y.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

ATTACHMENTS

POWER TRANSMITTING ATTACHMENTS

AUTO Power Co., 914 S. Michigan Ave., Chicago, Ill. "Helping Henry."

HELPING HENRY—See Auto Power Co.

BAGS

GREASE BAGS

(See Boots, Steering Knuckle)

LUGGAGE BAGS

(For attaching to back of front seats)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. (See page 793.)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

BANDING

BRAKE BANDING

AMERICAN Asbestos Co., Norristown, Pa. "Testbestos." (See page 619.)

APCO—See Auto Parts Co.

ASBESTOS & Rubber Works of New Jersey, Camden, N. J. "Longwear." (See page opp. Inside Back Cover.)

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

AXWELL Equipment Co., Ferguson Bldg., Pittsburgh, Pa.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

E. G.—See Grossman Mfg. Co.

FEDERAL Asbestos Co., Van Houton St., Paterson, N. J. "Fordbestos." (See pages 300 and 301.)

FORDBESTOS—See Federal Asbestos Co.

GENERAL Asbestos & Rubber Co., Charleston, S. C. (See page 81.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

J-M NON-BURN—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M Non-Burn."

Complete Index to Classification appears on Pages 28 to 32.

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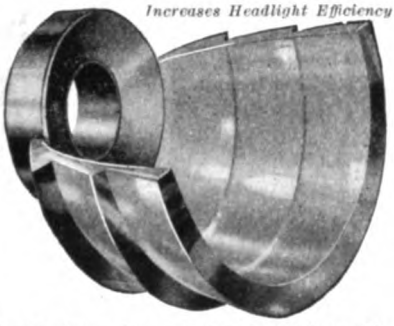
Increases Headlight Efficiency



For Maximum Downward Light Without Glare

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A two-ounce *glass* cup-shaped lens, attached under the bulb which utilizes all your light and all your reflector. It meets the requirements of the law and the requirements of lighting efficiency as well. No other anti-glare device does this. Others simply dim or obscure the light to check the glare. *"Fracto" utilizes every particle of light generated by the lamps.* The upward rays are not destroyed, but are mainly focused to the road. Enough of these rays remain directed up, however, to illuminate objects above the road. Furthermore, the "Fracto" does not diminish the long range effectiveness of the headlights. *It gives perfect projection to a greater distance than is possible without it.*

The "Fracto" is a simple device, easy to attach, strong, durable and economical. Will not break the bulbs. **Price $2.75 per pair.**

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Transmission Linings

transmit more of the motive power to the rear wheels—and more of the *selling* power to the live dealer.

Our **$1 Ford Set**

includes three proper lengths for Ford transmission and brake bands, complete with rivets ready to apply.

Easily sold—good profit.

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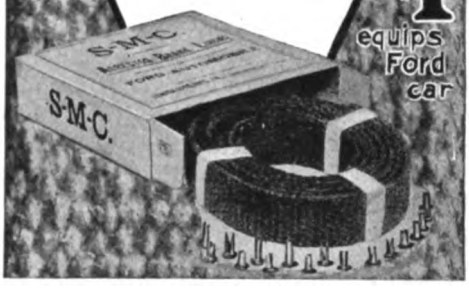
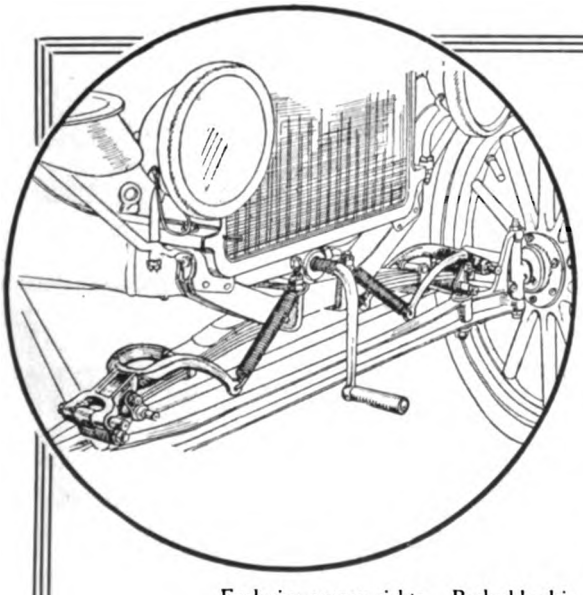
$1 equips Ford car





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For Ford Cars

The original double arm shock absorber. Guaranteed against breakage for one year. Sold on 10 days' trial—money back if not satisfied.

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BANDING (Continued)

BRAKE BANDING (Continued)

LONGWEAR—See Asbestos & Rubber Works of N. J.

ROYAL Equipment Co., Bridgeport, Conn. (See page 123.)

RUSCO—See Russell Mfg. Co.

RUSSELL Mfg. Co, Middletown, Conn. "Rusco." (See page 811.)

STANDARD Brake Lining Co., Gleasondale, Mass.

STAYBESTOS Mfg. Co., 5534 Lena St., (Germantown), Philadelphia, Pa. "Universal." (See page 581.)

TESTBESTOS—See American Asbestos Co.

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

UNIVERSAL—See Staybestos Mfg. Co.

TRANSMISSION BANDING

(See Banding, Brake)

BEDS

CAR BEDS OR BERTHS

AUTO Bed Co., Bellingham, Wash. "McMillin."

BOOTH & Co., Sheldon, 1505 E. 53d St., Chicago, Ill.

McMILLIN—See Auto Bed Co

SCHILLING Co., L. F., Seventh & Patee Sts., St. Joseph, Mo.

BELLS

ELECTRIC BELLS

LIBERTY Bell Co., Cleveland, O.

BELTS

FAN BELTS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

BADGER Handle Co., 323 E. Water St., Milwaukee, Wis.

BANTLIN Co., Julius J., 216 E. Third St., Cincinnati, O. (See page 583.)

BEAVER—See Mechanical Rubber Co.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CHICAGO Belting Co., 113-25 N. Green St., Chicago, Ill.

CHICAGO Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill. "Krome."

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

CURRY Co., J. W., 2615 Cummins St., Cincinnati, O.

E-Z-PUT-ON—See Paulus, Alfred H.

ETTINGER, M., 9-13 Ferry St., New York, N. Y. (See page 583.)

FAIRMANCO—See Fairmont Mfg. Co.

FAIRMONT Mfg. Co. (Brighton Station), Cincinnati, O. "Fairmanco."

FEDERAL Asbestos Co., Van Houton St., Paterson, N. J. "Fordbestos." (See pages 300 and 301.)

FORDBESTOS—See Federal Asbestos Co.

G. & K.—See Graton & Knight Mfg. Co.

GEISEL, Otto E., 706 Chestnut St., Philadelphia, Pa. (See page 501.)

GENERAL Tire & Rubber Co., Akron, O. (See page 531.)

GILMER Co., L. H., (Tacony), Philadelphia, Pa. (See page 105.)

GRATON & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 103.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HAGER & Son, Chas., 1876 Broadway, New York, N. Y.

HAGSTROM Bros. Mfg. Co., Lindsborg, Kan.

HANEY & Co., J. H., Hastings, Neb. "Rose."

HIDE, Leather & Belting Co., 229 S. Meridian St., Indianapolis, Ind. "Wetprufe." (See page 789.)

HOOVER Co., W. H., New Berlin, O.

INDIGAN—See National Leather Mfg. Co.

KROME—See Chicago Rawhide Mfg. Co.

LAKEWOOD Fabric Belting Co., 1518 Highland Ave., Lakewood, N. J.

LATIGE—See Perkins-Campbell Co.

LEATHER Tire Goods Co., Niagara Falls N. Y. (See pages 82 and 83.)

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill. "Usco," "Beaver."

MESINGER Mfg. Co., H. & F. Austin Pl. & E. 144th St., New York, N. Y.

MISSOURI Rubber Mfg. Co., 936 N. Kingshighway, St. Louis, Mo.

MITCHELL-SMITH Co., 1092 Commonwealth Ave., Boston, Mass.

MODERN Belt & Web Co., Piper Bldg., Baltimore, Md.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. "Nathigo." (See page 499.)

NATHIGO—See Nathan Novelty Mfg. Co.

NATIONAL Leather Mfg. Co., Niles, Mich. "Indigan."

NORWICH Belt Mfg. Co., Norwich, Conn.

PAULUS, Alfred H., 2507-11 Potter St., Philadelphia, Pa. "E-Z-Put-On."

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Latigo." (See page 207.)

PETERS & Herron Dash Co., Columbus, O. (See page 617.)

RHOADS & Sons, J. E., 12 N. Third St., Philadelphia, Pa.

ROSE—See Haney & Co.

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The Best Line for Ford Cars

FAN BELTS
CRANK BOOTS
BOW RESTS

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LEATHER SPRING HOOD STRAPS
LEATHER SPRING PADS
LEATHER MAGNETO COVERS

All Kinds of Auto Straps on Specification

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216 E. THIRD STREET
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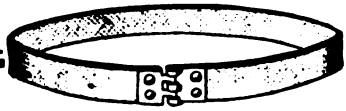

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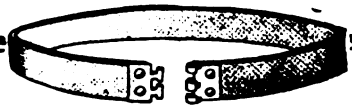

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BELTS (Continued)

FAN BELTS (Continued)

RUGG & Co., E. L., Newark, O. (See page 811.)

RUSCO—See Russell Mfg. Co.

RUSSELL Mfg. Co., Middletown, Conn. "Rusco." (See page 811.)

STANDARD Woven Fabric Co., Walpole, Mass. (See pages 75 to 78.)

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

USCO—See Mechanical Rubber Co.

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

WAKEFIELD Sales Co., Trempealeau, Wis.

WETPRUFE—See Hide, Leather & Belting Co.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

BOARDS

RUNNING BOARDS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

SPIRO Mfg. Co., 68-72 E. 131st St., New York, N. Y. "Uniq."

UNIQ—See Spiro Mfg. Co.

BODIES

SPECIAL BODIES

ACME Supply Co., 28 E. Jackson Blvd., Chicago, Ill.

ANDERSON Motor Co., Rock Hill, S. C.

AUTO Body Works, 1227 Broadway, Nashville, Tenn.

AUTO Remodeling Co., 1501 S. Michigan Ave., Chicago, Ill. "Remo."

BABCOCK Co., H. H., Watertown, N. Y.

BADGER Auto Body Co., Milwaukee, Wis. (See page 597.)

BAILEY Mfg. Co., North Wales, Pa.

BARNETT Auto Body Co., 425 Golden Gate Ave., San Francisco, Cal.

BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

BORBEIN Auto Co., 2109-11 N. Ninth St., St. Louis, Mo.

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CAMPBELL Co., Manson, Detroit, Mich. (See page 587.)

CENTRAL Wagon & Auto Co., 3416 Central Ave., Cleveland, O.

CHAMPION Racer Co., 1421 Michigan Ave., Chicago, Ill. (See page 609.)

CHAMPION Wagon Co., Owego, N. Y.

CHARLOTTE Wagon & Auto Co., 26 E. Sixth St., Charlotte, N. Car.

COLUMBIA Body Co. of Detroit, 21-27 Selden Ave., Detroit, Mich.

COLUMBIA Buggy Co., 21 Selden Ave., Detroit, Mich.

COLUMBIA Wagon Co., Columbia, Pa.

COMMERCIAL Auto Body Co., St. Louis, Mo.

DE LUXE—See Detroit Auto Products Co.

DETROIT Auto Products Co., 33 Sherman St., Detroit, Mich. "De Luxe." (See page 585.)

DUNHAM Co., Thos., 600 Garfield Ave., Aurora, Ill.

EXCELSIOR Seat Co., Fifth Ave. & River Rd., Columbus, O.

FASCO—See Fried & Stoner Co.

FRIED & Stoner Co., Peoria, Ill. "Fasco."

GUNMER Auto Specialty Co., 3744 Lake Park Ave., Chicago, Ill.

HABERER & Co., Cincinnati, O. (See page 585.)

HENNEY Buggy Co., Freeport, Ill.

HIGHLAND Body Mfg. Co., 716 Elmwood Pl., Cincinnati, O. (See page 111.)

HOOVER Wagon Co., York, Pa. (See page 587.)

HOPKINS & Co., J., 2420 W. 22d St., Chicago, Ill.

IRONCLAD Racing Body Co., 342 Jackson Blvd., Chicago, Ill.

KRATZER Carriage Co., First St., Des Moines, Ia.

KRESSLER Auto Co., Fostoria, O.

LONDON Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

LUTH Carriage Co., 1911-27 W. Eighth St., Cincinnati, O.

McAVOY Co., M. I., 1220 Washington St., Racine, Wis. (See page 855.)

MANDEL Limousine Co., 1445-57 Congress St., Chicago, Ill.

MARTIN Carriage Works, York, Pa. (See page 587.)

MIFFLINBURG Body & Gear Co., Mifflinburg, Pa.

MIFFLINBURG Buggy Co., Mifflinburg, Pa. (See page 587.)

MONDAY Co., A. J., 327 Fourth St., Milwaukee, Wis.

MOTOR Truck Body Co., 611 Central Ave., Detroit, Mich.

MURPHY Co., P. J., 6 Central Ave., Minneapolis, Minn.

OETTINGER Wagon Co., Greensboro, N. C.

OHIO Welding & Mfg. Co., 828-30 W. Sixth St., Cincinnati, O.

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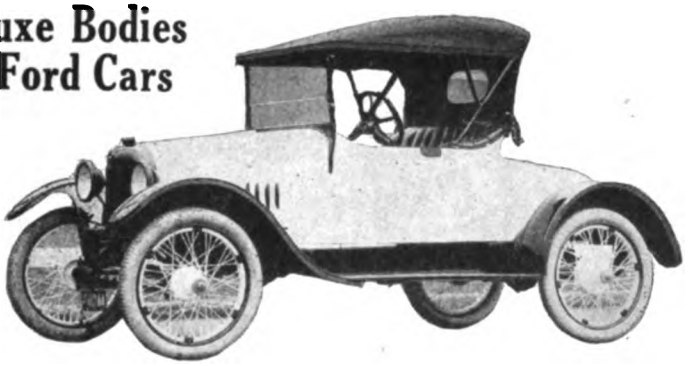
De Luxe Bodies For Ford Cars



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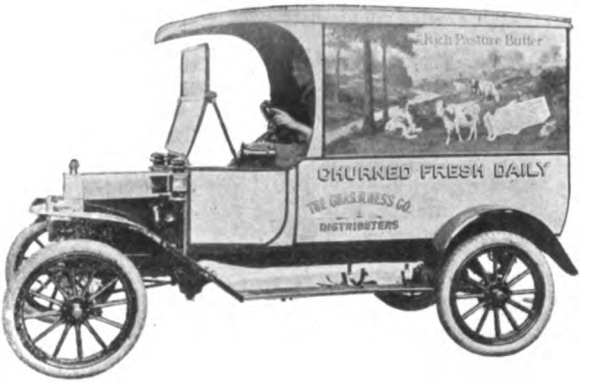

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BODIES (Continued)

SPECIAL BODIES (Continued)

PACO—See Peoria Accessory Co.

PANNETON Carriage & Auto Co., 26-38 Jefferson St., Waterbury, Conn.

PARRY Mfg. Co., 110 Parry Ave., Indianapolis, Ind.
(See page 589.)

PEORIA Accessory Co., 601-07 S. Washington St., Peoria, Ill. "Paco."

R. & H. Sheet Metal Co., 109 Center Ave., Abington, Mass.

REMO—See Auto Remodeling Co.

ROBBINS & Co., Irvin, Indianapolis, Ind.
(See page 111.)

SCHMITZ & Bro., Geo., 666-68 Genesee St., Buffalo, N. Y.

SCHUBERT Wagon Co., August, Oneida, N. Y.

SMITH Carriage Co., R. J., Lake & Lyell Sts., Rochester, N. Y.

SPECIALTY Mfg. Co., Cincinnati, O.
(See page 589.)

SPRINGFIELD Commercial Body Co., Whitney Bldg., Springfield, Mass.

SPRINGFIELD Body Co., Springfield, Mass.

STORM Buggy & Auto Top Co., Fostoria, O.

STOVER Steel Tank & Mfg. Co., Hancock Ave., Freeport, Ill.

SWAN Demountable Body Co., 4021 Payne Ave., Cleveland. O.

TEXAS Wagon Works, Houston, Tex.

TOPFORD Co., 112-16 Grove St., Hempstead, N. Y.

UNICO—See Unit Construction Co.

UNIVERSAL Car Equipment Co., 62 E. Jefferson Ave., Detroit, Mich.

WADSWORTH Mfg. Co., Detroit, Mich.

WALKER & Co., Alfred J., 223 W. 66th St., New York, N. Y.

WEBER Co., M., 213-20 N. St. Clair St., Dayton, O.

WEBER Co., O. M., North Wales, Pa.

WILLIAMS Wagon Works, Third St., Macon, Ga.

WILLOUGHBY Co., Dwyer Ave. & Turner St., Utica, N. Y.

BOLTS

ENGINE BOLTS

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

SPECIAL BOLTS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

BOOTS

STEERING KNUCKLE BOOTS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

CAMPBELL—See Perkins-Campbell Co.

CHICAGO Wholesale Saddlery & Mfg. Co., 123 N. Halsted St., Chicago, Ill.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. "Campbell."
(See page 207.)

BOXES

BATTERY BOXES

(See Boxes, Tool)

SPRING OILING BOXES

(See Cups, Spring Leaf Lubricating)

TOOL AND BATTERY BOXES

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

MITCHELL & Son, G. F., 6501 Cedar Ave., Cleveland, O.

OAKES Co., Dept. A, Indianapolis, Ind.
(See page 223)

VICTOR Auto Parts Co., Second & Elm Sts., Cincinnati, O.

BRACES

HEADLIGHT BRACES

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., 702 Eddy St., Providence, R. I. "Apco."
(See page 607.)

MUD GUARD BRACES

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-76 W. Randolph St., Chicago, Ill.

NEW Era Spring & Specialty Co., 850 Woodward Ave., Detroit, Mich.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

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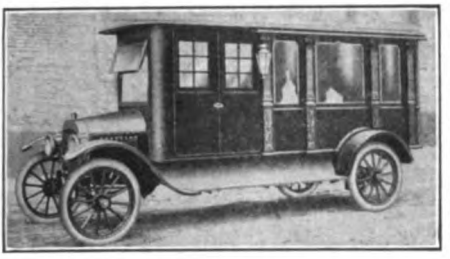
THE HEARSE-FORD



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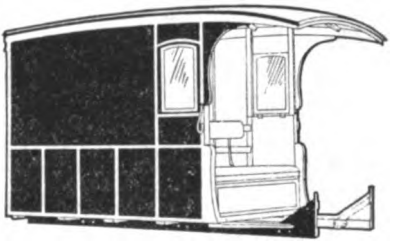

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BRACES (Continued)

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CASEY Asco Mfg. Co., 1504 Grand Ave., Kansas City, Mo.

H. & M.—See Radius Rod Co.

RADIUS Rod Co., Lamoni, Ia. "H. & M."

SAFETY Mfg. Co., Illinois State Bank Bldg., Quincy, Ill.

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.
(See page 653.)

VAUGHN-HARRIS Co., Vermilion, S. Dak.

VON WETTBERG, E. F., 1188 Main St., Bridgeport, Conn.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis.

STEERING COLUMN BRACES

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

MALCO—See Malton Specialty Co.

MALTON Specialty Co., 755 Boylston St., Boston, Mass. "Malco."
(See page 607.)

MILLER Machine & Tool Co., Wilson St. & C. & N. R. R., Bryan, O.

BRACKETS

AUTOMATIC HEADLIGHT BRACKETS

AUTOMATIC Control Co., 416-22 E. First St., Dayton, O.

TIMER ELEVATING BRACKETS

(See also Timers, Ignition)

ATLANTIC Machine Co., 258 E. 15th St., Brooklyn, N. Y.

BRAKES

EMERGENCY CONTRACTING BRAKES

BENNETT, F. O., 2519 Broadway, Oakland, Cal.
(See page 589)

MASTER Equipment Co., 2200 S. Main St., Los Angeles, Cal.

BREATHERS

CRANK CASE BREATHERS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

CRUM-WILEY Mfg. Co., Peru, Ind.

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

N. Y. Motor Car Device Co., 299-11 11th Ave., New York, N. Y. "Premo."

PREMO—See N. Y. Motor Car Device Co.

BUMPERS

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger."
(See page 865.)

BADGER—See Auto Parts Mfg. Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "E-Z."
(See page 717.)

E. G.—See Grossman Mfg. Co.

E-Z—See Cox Brass Mfg. Co.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

IDEAL—See Metal Stamping Co.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Ideal."

MILWAUKEE Auto Engine & Supply Co., 29th St. & Mineke Ave., Milwaukee, Wis.

PERFECT—See Pratt Mfg. Co.

PRATT Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Perfect."

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich. "Yankee."

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
(See page 817.)

YANKEE—See Simplex Auto Specialty Co.

BUSHINGS

BRONZE BUSHINGS

AMERICAN Pin Co., (Waterville Station), Waterbury, Conn.

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

CRUM-WILEY Mfg. Co., Peru, Ind.

E. G.—See Grossman Mfg. Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass.
(See page 625.)

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
(See page 453.)

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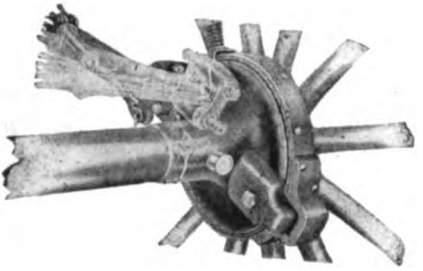
Bennett Contracting Emergency Brake For Fords



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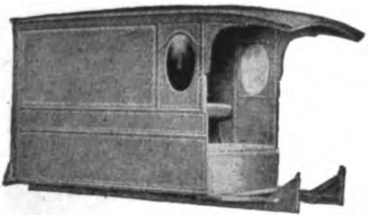

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BUSHINGS (Continued)

BRONZE BUSHINGS (Continued)

JOHNSON Bronze Co., New Castle, Pa.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

CAM SHAFTS

SPECIAL CAM SHAFTS

NOONAN, D. R., W. Washington St., Paris, Ill.

CAPS

GASOLINE TANK CAPS

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

HUB CAPS

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

DANVER Accessory Co., Pawtucket, R. I.

E. G.—See Grossman Mfg. Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y.

STARR Bros., East Hampton, Conn.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

RADIATOR CAPS

ALLEN Mfg. Co., W. D., 133-35 W. Lake St., Chicago, Ill.

AMERICAN Pin Co., (Waterville Station), Waterbury, Conn.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

CRUM-WILEY Mfg. Co., Peru, Ind.

E. G.—See Grossman Mfg. Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

EZYFILL—See Walker Mfg. Co.

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GREER Fredric, 525 W. Van Buren St., Chicago, Ill.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HALLADAY Co., L. P., Streator, Ill.

HOME Light Co., 3351 Milwaukee Ave., Chicago, Ill.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis. "Ezyfill."

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. (See page 817.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

CARBURETERS

BALL-SPRAY—See Shain, Chas. D.

BREEZE Carburetor Co., 250-52 South St., Newark, N. J.

BROWNE BRANFORD—See Holt-Welles Co.

BYRNE, Kingston & Co., 1040 Webster St., Kokomo, Ind. "Kingston."

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

CAMDEN-ANCHOR Rockland Machine Co., Camden, Me. "Knox."

CARTER Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

D & B—See Duffy-Beamer Co.

DETROIT Lubricator Co., Detroit, Mich. "Stewart." (See page 677.)

DUFFY-BEAMER Co., 341-45 N. Crawford Ave., Chicago, Ill. "D & B."

F. A. C.—See Whalen Engineering Co.

FINDEISEN & Kropf Mfg. Co., 2125 Rockwell St., Chicago, Ill. "Rayfield." (See page 135.)

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Whitehouse-Le Compte Mfg. Co., Newark, N. J.

Drive Shaft Roller Bearings.

No. 2587—D. S. Roller Bearing, list.....$1.30
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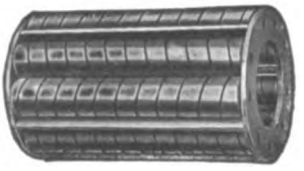
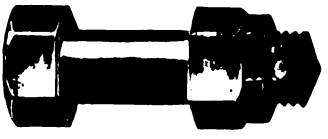
No. 2591—D. S. Ball Thrust Collar, list..... .40
No. 2592—D. S. Ball Bearing, list..... .03
No. 2593—D. S. Roller Bearing Sleeve, list..... .90
No. 2596—D. S. Sleeve, list..... .75
No. 2598—D. S. Castle Nut, list..... .05
No. 2598B—D. S. Pinion Key, list..... .05
No. 2540—D. S. Housing Front Bushing, list..... .30



Drive Shaft Roller Bearings.



Bolts for Ford Cars.

Bolts for Ford Cars.	Dia.	L'gth	Trd.	List
No. 2551—Radius Rod Bolt and Nut.....	1/2	1 1/2	20	$0.5
No. 2503-B—Axle Housing Bolt and Nut.....	5/16	25/32	..	.05
No. 2503-E—Axle Housing Bolt and Nut.....	5/16	1 5/16	..	.05
No. 2519—Differential Drive Gear Screw.....	5/16	21/32	24	.02
No. 2548—Radius Rod Nut Castellated.....	9/16	.....	18	.05
No. 2568—Brake Shoe Support Nut.....	1/2	.....	20	.03
No. 2598—D. S. Castel Nut.....	5/8	.....	18	.05
No. 2697—Spindle Arm Nut.....	9/16	.....	18	.05
No. 2711—Spindle Bolt Nut.....	1/2	.....	20	.03
No. 2719—Spindle Connecting Rod Bolt Nut.....	7/16	.....	20	.02
No. 2729—Ball Socket Bolt and Nut.....	3/8	17/32	24	.05
No. 2734—Front Radius Rod Nut.....	9/16	.....	18	.05
No. 2739—Front Radius Rod Ball Cap Screw.....	3/8	.....	16	.05
No. 2825—Hub Bolt and Nut.....	3/8	2 1/8	16	.05
No. 2828—Rear Hub Lock Nut.....	5/8	.....	18	.05
No. 3003—Cyl. Head Cap Screw.....	7/16	2 9/16	14	.05
No. 3008—Cyl. Head Out-let Conn. Screw.....	7/16	15/16	20	.05
No. 3010—Cyl. Cover Bolt.....	3/8	7/8	24	.05
No. 3011—Cyl. Cover Cap Screw.....	3/8	11/16	24	.05
No. 3014—Cyl. Cover Crank Case Bolt and Nut.....	3/8	17/32	24	.05
No. 3016—Cyl. Inlet Conn. Screw.....	7/16	1 1/2	14	.05
No. 3074—Crank Arm Bolt and Nut "Top".....	3/8	25/32	20	.05
No. 3078—Crank Case Front Bearing Screw.....	7/16	7/8	20	.05
No. 3270—Fly Wheel Cap Screw.....	7/16	1 3/16	14	.10
No. 3665—Gas Lamp Bracket Nut.....	1/2	.....	20	.05
No. 3811—Front Spring Tie Bolt and Nut.....	5/16	2 1/4	18	.10
No. 3837—Rear Spring Tie Bolt and Nut.....	3/8	2 15/16	..	.10
No. 3852—Rear Spring Tie Bolt and Nut.....	3/8	3 9/32	..	.10

Drive Shaft Ball Bearing Assembly for Ford Cars.

Drive Shaft Ball Bearing Assembly fer Ford Cars.

No. 2589B—D. S. Ball Bearing Assembly, each.$0.75
No. 2589—D. S. Ball Race, 2⅝ Dia., each..... .20
No. 2590—D. S. Ball Retainer, each..... .03
No. 2591—D. S. Thrust Collar, each..... .40
No. 2592—D. S. Ball Bearing, each..... .03
No. 2593—D. S. R. B. Outer Sleeve, each..... .90
No. 2596—D. S. Sleeve, each..... .75

Stationary Cone.
No. 2704—Stationary cone, each $0.20

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Whitehouse-Le Compte Mfg. Co., Newark, N. J.

Oval Autoscope
No. 98-B. 4 x 6 Beveled Plate Glass, $2.00
No. 101-B. 5 x 7 Beveled Plate Glass, 2.50

The Autoscope, made only by Whitehouse-Le Compte Mfg. Co.

Oval Autoscope
No. 98-A. 4 x 6 Beveled Plate Glass, $2.00
No. 101-A. 5 x 7 Beveled Plate Glass, 2.50

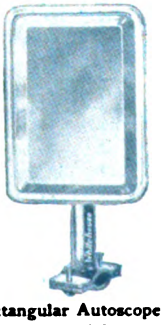
Oval Autoscope
No. 98-D. 4 x 6 Beveled Plate Glass, $2.00
No. 101-D. 5 x 7 Beveled Plate Glass, 2.50

Oval Autoscope
No. 98-C. 4 x 6 Beveled Plate Glass, $2.00
No. 101-C. 5 x 7 Beveled Plate Glass, 2.50

Rectangular Autoscope
No. 99-B. 4 x 6 Beveled Plate Glass, $2.00
No. 100-B 5 x 7 Beveled Plate Glass, 2.50

Oval Autoscope
No. 98-E. 4 x 6 Beveled Plate Glass, $2.00
No. 101-E. 5 x 7 Beveled Plate Glass, 2.50

Rectangular Autoscope
No. 99-A. 4 x 6 Beveled Plate Glass, $2.00
No. 100-A. 5 x 7 Beveled Plate Glass, 2.50



Rectangular Autoscope
No. 99-C. 4 x 6 Beveled Plate Glass, $2.00
No. 100-C. 5 x 7 Beveled Plate Glass, 2.50

Rectangular Autoscope
No. 99-E. 4 x 6 Beveled Plate Glass, $2.
No. 100-E. 5 x 7 Beveled Plate Glass, 2.50

Rectangular Autoscope
No. 99-D 4 x 6 Beveled Plate Glass, $2.00
No. 100-D. 5 x 7 Beveled Plate Glass, 2.50

List of cars and style of clamp used on each.

Type	Type	Type	Type	Type	Type	Type	Type
C Apperson	Carter	A Lexington	Moline	Dorris	D Hup	C Paige	Standard
I Allen	Case	Locomobile	A Moon	Dort	C Hollier	F Pierce Arrow	Stearns
Abbott	C Chalmers	Lozier	B No. 490	C Elkhart	Inter-State	Premier	D Studebaker
C Anderson	A Chandler	A Marmon	Chevrolet	C Empire	Jackson	A Pullman	C Stutz
G Conover	C Chevrolet	G Maxwell	C Cole	Enger	B Jeffery	Regal	A Velie
Winton	C Hollier	Mercer	Crawford	E Overland	A National	B Reo	Westcott
A Auburn	King	Metz	A Crow	A Ford	C Oakland	I Saxon	White
I Briscoe	C Kissel	C Mitchell	Elkhart	Franklin	H Olds	A Scripps	
A Buick	Kline		Detroiter	I Grant	A Packard	Simplex	
A Cadillac	Lewis		A Dodge	A Haynes			

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Whitehouse-Le Compte Mfg. Co., Newark, N. J.

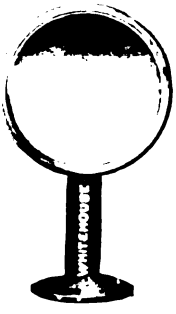
Round Autoscope
No. 102-A. 5 inch Beveled Plate Glass, $2.50
No. 1020-A. 5 inch Convex Glass, 2.00

Round Autoscope
No. 102-B. 5 inch Beveled Plate Glass, 2.50
No. 1020-B. 5 inch Convex Glass, 2.00

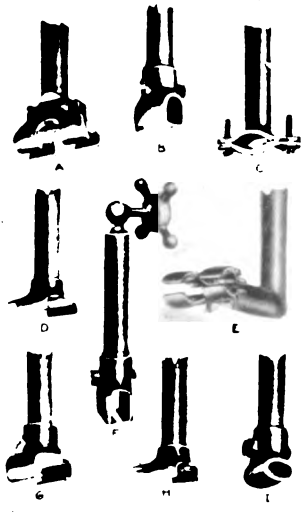
Round Autoscope
No. 102-C. 5 inch Beveled Plate Glass, 2.50
No. 1020-C. 5 inch Convex Glass, 2.00

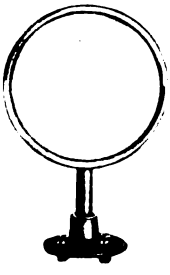
Round Autoscope
No. 102-D. 5 inch Beveled Plate Glass, 2.50
No. 1020-D. 5 inch Convex Glass, 2.00

Any of these Autoscope Clamps will be supplied with our Autoscopes without extra charge. The list below shows which should be selected.



Round Fender Autoscope (for all cars)
No. 105. 5 inch Convex glass, ball and socket joint, each 2.00





Round Fender Autoscope (for all cars)
No. 106. 5 inch Round Convex Glass, 1.00
No. 107. 4 inch Round Convex Glass, .90

Round Autoscope
No. 103-A. 4 inch Convex Glass, 1.00
No. 104-A. 5 inch Convex Glass, 1.20

Clamp A
Auburn, Chandler, Crow, Dodge, Ford, Haynes, Moon, Packard, Scripps, Pullman, Velie, Chevrolet, Lexihgton, Vanguard, Davis, Marion, Marmon, National

Clamp B
Reo, White, Maxwell, 400, Chevrolet, Jeffery, Haynes

Clamp C
Chalmers, Chevrolet, Hudson, Saxon, Stutz, Mitchell, Paige, Abbott, Olds, Oakland, Pullman, Apperson, Cole, Hollier, Empire, Kissel, Grant

Clamp D
Studebaker, Hup

Clamp E
Overland

Clamp F
Pierce

Clamp G
Maxwell, Conover, Shield

Clamp H
Olds, Chalmers, Hudson, Grant, Briscoe

Clamp I
Chevrolet, Stutz, Cadillac, Allen, Paige, Saxon, Mitchell, Buick, Olds

Round Autoscope
No. 102-E. 5 inch Beveled Plate Glass, 2.50
No. 1020-E. 5 inch Convex Glass, 2.00

All Autoscopes are finished in full black, black with nickel rim or black with brass rim. The price is the same for each. Specify your choice when ordering.

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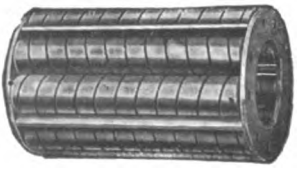


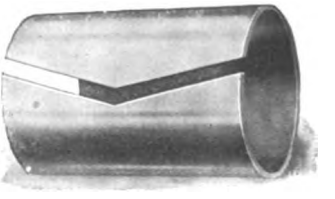
Axle Shaft Roller Bearings for Ford Cars.

Axle Shaft Roller Bearings for Ford Cars.

No. 2508—Axle Shaft Roller Bearing, list.....$0.75
No. 2508-9—Bearing and Sleeve, list..... .95
No. 2508-9B—Bearing and sleeve, list..... .95

Axle Shaft Roller Bearing Sleeves.

No. 2509—Right Sleeve, list.....$0.20
No. 2509B—Left Sleeve, list..... .20



Axle Shaft Roller Bearing Sleeves.

Front Hub Assembly for Ford Cars.

Front Hub Assembly for Ford Cars.

No. 2803C—Front Hub Assembly, each.$2.00

Radiator Cap.

No. 143—Fine Polished Brass, each.....$0.5[illegible]
No. 143—Fine Nickel Finish, each..... .60
No. 143B—Black Hard Rubber, each..... .32

Radiator Cap.

Bushings for Ford Cars, Guaranteed Perfect, Seamless and Open Seam.

Bushings for Ford Cars, Guaranteed Perfect, Seamless and Open Seam.

Description

No. 2525—Differential Pinion Bushing, list price.$0.05
No. 2525B—Differential Pinion Bushing, list price. .05
No. 2559—Hub Cam Shaft Bushing, list price.... .10
No. 2713—Spindle Body Bushing, list price..... .20
No. 2714—Spindle Arm Bushing, list price..... .05
No. 3022½—Piston Pin Bushing, list price, pair. .35
No. 3044—Cam Shaft Rear Bearing, list price.... .30
No. 3314—Transmission Triple Gear Bushing, list price..... .30
No. 3314½—Transmission Triple Gear Flanged Bushing, list price..... .30
No. 3820—Front Spring Perch Bushing, list price .05
No. 3844—Rear Spring Perch Bushing, list price. .20
No. 2517—Differential Case Bushing, list price... .30
No. 2527—Spider Bushing, list price..... .20
No. 2540—D. S. Housing Bushing (Genuine Babbitt) list price..... .40

Crank Case Oil Gauge for Ford Cars.

Crank Case Oil Gauge for Ford Cars.

No. 139—⅝ Glass, each.....$0.20

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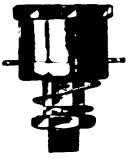


Ratchet Compression Brass and Steel Grease Cups.

Ratchet Compression Brass and Steel Grease Cups

No. 209—Patented Oct. 18, 1914

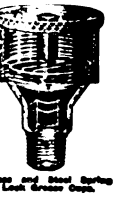
Price List

Number	000	00	0	1
Inside Diameter, in	¾	1	1¼	1½
Shank Pipe Thread, in	⅛	⅛	¼	¼
Capacity (Grease), oz	¼	½	⅔	1
Finished Brass, each	$0.30	$0.36	$0.44	$0.60
Rough Brass, each	.26	.32	.40	.54
Nickel Plated, each	.34	.40	.50	.68

Brass and Steel Spring Lock Grease Cups

No. 247—Pat. April 20, 1909; Pat. July 4, 1911

Number	000	00	0	1
Inside Diameter, in	¾	1	1¼	1½
Regular Pipe Thread, in	⅛	⅛	¼	¼
Capacity (Grease), oz	¼	½	⅔	1
Optional Pipe Thread, in	.....	¼	⅛	⅛ ⅜
Optional Female, in		⅛	⅛	⅛–¼
Polished Brass Finish, each	$0.28	$0.34	$0.42	$0.58
Dull Brass Finish, each	.24	.30	.38	.52
Nickel Plated Brass, each	.32	.38	.48	.66
Rough Steel, each	.20	.26	.34	.50

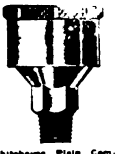


Brass and Steel Spring Lock Grease Cups.

Whitehouse Plain Compression Brass and Steel Grease Cups: Style 200

Price List

Number	000	00	0	1
Inside Diameter, in	¾	1	1¼	1½
Regular Pipe Thread, in	⅛	⅛	¼	¼
Capacity (Grease), oz	¼	½	⅔	1
Polished Brass Finish, each	$0.18	$0.22	$0.26	$0.30
Dull Brass Finish, each	.16	20	.24	28
Nickel Plated Brass, each	.18	22	.26	.30
Rough Steel Finish, each	.10	12	14	18
Optional Thread	.....	¼ pipe	⅛ pipe	⅛ ⅜ pipe



Whitehouse Plain Compression Brass and Steel Grease Cups; Style 200.

Whitehouse Plain Compression Brass and Steel Grease Cups.

Whitehouse Plain Compression Brass and Steel Grease Cups

Fig. 207—Fitted with Leather Washer

Sizes, Threads and List Prices

Number	000	00	0	1	2
Inside Diameter, in	¾	1	1¼	1½	2
Regular Pipe Thread, in	⅛	⅛	¼	¼	⅜
Capacity (Grease), oz	¼	½	⅔	1	2
Polished Brass Finish, each	$0.22	$0.26	$0.30	$0.40	$0.50
Dull Brass Finish, each	20	24	.28	.34	.40
Nickel Plated Brass, each	.36	.35	.40	.50	60
Rough Steel Finish, each	.14	.18	.20	.24	.35
Optional Thread, in	5/16 .32	5/16 .32	⅛ pipe	⅛ pipe	¼ pipe

Orders for Brass Cups will be filled with polished brass finish. Orders for Steel Cups will be filled with rough steel finish. Regular pipe thread always sent unless otherwise specified.

Fig. 222 (Patented).

Fig. 222 (Patented)

Sizes, Threads and List Prices

Number	000	00	Number	00	00
Height, Overall, in	2¼	2⅝	Capacity (Grease), oz	¼	½
Clearance Necessary to Open Cup to Fill, in	2¾	3⅜	Regular Pipe Thread, in	⅛	⅛
Diameter of Cap, In	¾	1 3/32	Polished Brass Finish, each	$0.45	$0.55
Diameter of Hex., in	11/16	1⅛	Nickel Plated Brass, each	50	60

Cups are made of brass and can be furnished polished or nickel plated. Polished brass finish and regular threads will be sent if not otherwise specified.

T-Handle Grease Cups, No. 101

Price List

Number	000	00	0
Inside Diameter, in	½	¾	⅞
Shank Pipe Thread, in	⅛	⅛	⅛
Capacity (Grease), oz	$0.15	$0.20	$0.25
Dull Brass, each	$0.15	$0.20	$0.25
Nickel Plated, each	.17	.24	.30

T-Handle Grease Cups, No. 101.

Special Oiler for All Spindle Body and Spindle Arm Bolts, No. 248.

Special Oiler for All Spindle Body and Spindle Arm Bolts, No. 248

No. 248—Black Rubber Finish, each $0.30

Spring Oil Cup.

Licensed under Winkley Patent No. 2715

Brass, 10c each. Nickel, 14c.

The above Spring Cup should not be confused with the plain cheap cups that are now on the market.

Spring Oil Cup.

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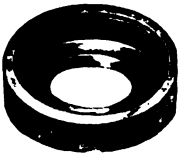
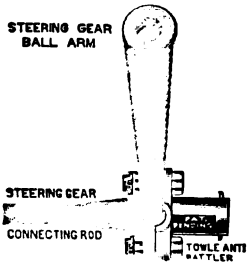


Ball Race.

Ball Races

No. 2804—Small Outer Race, each	$0.10
No. 2805—Large Inner Race, each	.15
No. 2806—Outside Ball Retainer, each	.02
No. 2807—Inside Ball Retainer, each	.03
No. 2810—Large Ball, ½ inch diam., each	.04
No. 2811—Small Ball, ⅜ inch diam., each	.03



Steering Rod Anti-Rattlers.

Breather and Oil Filler

No. 177—Black Hard Rubber Finish, each $0.80

Breather and Oil Filler

Steering Rod Anti-Rattlers

No. 165—Black Hard Rubber Finish, per set	$0.30
No. 165—Solid Bronze, per set	.40

Licensed under Towle Patent

Rear Hub

No. 2815C—Rear Hub, each $1.50

Rear Hub.

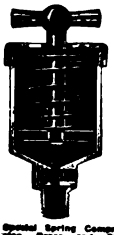
Special Spring Compression Brass and Steel Grease Cups

Fig. 216 (Patented)

Sizes, Threads and List Prices

Number	00	0	1	2	3	4
Inside Diameter, in	1	1 1/4	1 1/2	2	2 1/2	2 13/16
Extreme Outside Dia., in	1 13/64	1 23/64	1 13/16	2 11/64	2 27/64	3 3/16
Extreme Height, Plunger Raised, Cup Oopen, in	3 3/4	5	5 7/8	7 3/16	7 13/16	9
Regular Pipe Thread, in	1/8	1/4	1/4	3/8	1/2	1/2
Capacity (Grease), oz	1/2	1	1 1/2	3	6	10
Finished Brass, each	$0.30	$0.40	$0.50	$0.64	$0.86	$1.12
Nickel Plated Brass, each	.35	.45	.56	.72	1.00	1.30
Rough Steel, each	.26	.30	.35	.40	.55	.72
Optional Pipe Thread, in	1/4	1/8	1/8–3/8	1/4–1/2	1/4–3/8	3/4

Polished brass finish and regular threads will be sent if not otherwise specified.



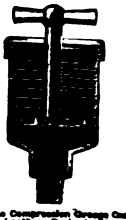
Special Spring Compression Brass and Steel Grease Cups.

Marine Compression Grease Cups with Leather Packed Plunger and Locking Cap

Fig. 214

Sizes, Threads and List Prices

Number	00	0	1	2	3	4
Inside Diameter, in	1	1 1/4	1 1/2	2	2 1/2	2 13/16
Extreme Outside Dia., in	1 13/64	1 23/64	1 13/16	2 11/64	2 27/64	3 3/16
Extreme Height, Plunger Raised, Cup Open, in	3 17/32	4 11/16	5 7/16	6 7/8	7 5/16	8 3/4
Capacity (Grease), oz	1/2	1	1 1/2	3	6	10
Regular Pipe Thread, in	1/8	1/4	1/4	3/8	1/2	1/2
Optional Pipe Thread, in	1/4	1/8	1/8–3/8	1/4–1/2	1/4–3/8	3/4
Optional Female Thread, in	1/8	1/8	1/8–1/4	1/4–3/8	1/4–3/8	3/8–1/2
Finished Brass, each	$0.33	.38	.49	.59	.80	1.05
Nickel Plated Brass, ea	.38	.45	.56	.69	.95	1.30
Rough Steel, ea	.28	.32	.38	.43	.54	.68

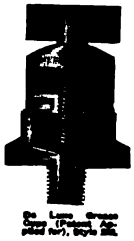


Marine Compression Grease Cups with Leather Packed Plunger and Locking Cap.

De Luxe Grease Cups (Patent Applied for) Style 232

Price List

Number	000	00	0	1
Inside Diameter, in	5/8	3/4	13/16	1 1/8
Regular Pipe Thread, in	1/8	1/8	1/8	1/4
Capacity (Grease), oz	1/8	1/4	1/3	1/2
Polished Brass, each	$0.50	$0.60	$0.70	$0.90
Nickel Plated, each	.55	.65	.75	.95



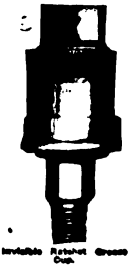
De Luxe Grease Cups (Patent Applied for), Style 232.

Invisible Ratchet Grease Cup

Fig. 233 (Patented)

Sizes, Threads, and List Prices

Number	000	00	0
Inside Diameter, in	1/4	1	1 1/4
Regular Pipe Thread, in	1/8	1/8	1/4
Capacity (Grease), oz	3/16	3/8	1/2
Dull Brass, ea	$0.35	$0.45	$0.55
Polished Brass, ea	.40	.50	.60
Brass, Nickel Plated, ea	.50	.60	.70



Invisible Ratchet Grease Cup.

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BADGER
AUTO BODY CO.

STURDY construction, advanced design and the needs of the particular business for which the body is to be used, are the outstanding factors of our commercial bodies.

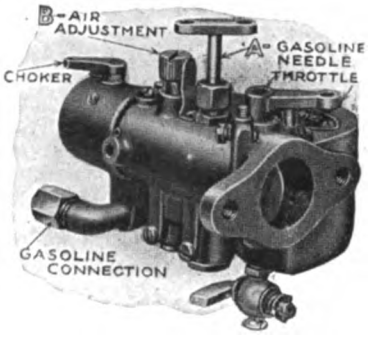
Our engineers will give you valuable assistance in designing the body best suited to the requirements of your customers' business.

The price will be lower than is usually paid for the average type of body which will not stand the racking strains of delivery service.

BADGER AUTO BODY CO.
Milwaukee - Wis.

MARVEL
"Its name defines it"
MODEL N FOR FORDS

Designed especially to fit right in place of regular Ford installation. No changes whatsoever necessary.



A high class instrument for Ford cars. Increases mileage to 22-25 miles per gallon. Sold on 30 day trial. Money back if not satisfactory. Dealers' proposition on request.

RETAILS AT $8.00
WRITE FOR CATALOGUE

MARVEL CARBURETER CO.
Flint, Mich., U.S.A.

'Miller'
America's Best Carburetor Wants America's Best Dealers

MILLER

offers dealers the most remarkable carburetor opportunity since carburetors were first built. For MILLER is conceded by authorities to represent the biggest forward step taken in carburetion for years. It approaches the ultimate in carburetor construction.

Consider that MILLER has won every important race this year, and that racing is nothing more than a concentrated test of every-day carburetor efficiency. Consider that MILLER is the most simple carburetor built; it has but 26 parts. Consequently it is most troubleproof. Consider that MILLER is absolutely *automatic* and has positively no adjustments.

Success and a profitable future await dealers foresighted enough to get the MILLER agency NOW—*while they can.* Desirable territory open. Write or call on us.

Miller Carburetor Sales Corporation
Los Angeles, Cal., 834 S. Los Angeles St.
Chicago, 2526 Michigan Avenue.

USED AND ENDORSED BY AMERICA'S CHAMPIONS

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CARBURETERS (Continued)

GLEASON-PETERS Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y. "Maco."

GRIFFIN Carburetor Co., 55 River St., Paterson, N. J.

H & N Carburetor Co., 1790 Broadway, New York, N. Y.
(See pages 300 and 301.)

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco."
(See page 675.)

HOLLEY Bros. Co., Detroit, Mich.

HOLT-WELLES Co., 1790 Broadway, New York, N. Y. "Browne Branford."

JOHNSON Co., 280 Harper Ave., Detroit, Mich.

KINGSTON—See Byrne, Kingston & Co.

KNOX—See Camden-Anchor Rockland Machine Co.

M. T.—See Sunderman Corp.

MACO—See Gleason-Peters Air Pump Co.

MARVEL Carbureter Co., Flint, Mich.
(See pages 135 and 597.)

MASTER Carbureter Corp., 1523-31 Fort St., W., Detroit, Mich.

MILLER Carburetor Sales Corp., 2526 Michigan Ave., Chicago, Ill.
(See page 597.)

PRICE, John R., 68 Marshall St., Newark, N. J.

RAYFIELD—See Findeisen & Kropf Mfg. Co.

SCHEBLER—See Wheeler & Schebler.

SHAIN, Chas. D., Brooklyn, N. Y. "Ball-Spray."

STEWART—See Detroit Lubricator Co.

SUNDERMAN Corp., Newburgh, N. Y. "M. T."
(See page 757.)

SWAN Carburetor Co., 540 Van Ness Ave., San Francisco, Cal.

WESTERN Motor Appliance Co., 201 Main St., Charles City, Ia.

WHALEN Engineering Co., 1790 Broadway, New York, N. Y. "F. A. C."

WHEELER & Schebler, Indianapolis, Ind. "Schebler."
(See page 783.)

ZENITH Carbureter Co., Detroit, Mich.
(See page 559.)

CASES

CURTAIN CASES

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

LUGGAGE CASES

(See Bags, Luggage)

TIRE CASES

ALLEN Auto Specialty Co., 1926 Broadway, New York, N. Y.
(See page 163.)

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. "Ezy," "Howard."
(See page 793.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

EZY—See Atlas Specialty Mfg. Co.

HOPEWELL Bros., Watertown, Mass.
(See page 617.)

HOWARD—See Atlas Specialty Mfg. Co.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

CHARGERS

MAGNETO MAGNET CHARGERS

BENJAMIN Electric Mfg. Co., 120 S. Sangamon St., Chicago, Ill.

KINGSTON—See Kokomo Electric Co.

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

QUALITY—See Sypher Tool Mfg. Co.

SYPHER Tool Mfg. Co., 2208 Warren St., Toledo, O. "Quality."

CHECKS

STEERING GEAR CHECKS

ACME Steering Device Co., 12th & Filbert Sts., Philadelphia, Pa.
(See page 599.)

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger."
(See page 865.)

AUTO Specialty Mfg. Co., 1207-15 G Ave., E., Cedar Rapids, Ia.
(See page 599.)

AUXILIARY Spring Co., 35 Herman St., Worcester, Mass.

BADGER—See Auto Parts Mfg. Co.

BUNKER Sales Co., Glendale Bldg., Kansas City, Mo.

BADGER—See Safety Appliance Co.

COMFORT Motor Machine Co., 715 Galapago St., Denver, Colo.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

DRIVE-RITE—See Economy Gas Lamp Co.

ECONOMY Gas Lamp Co., 215-17 Goodrich Pl., Kansas City, Mo. "Drive-Rite."

HASTINGS Mfg. Co., Hastings, Mich.
(See page 452.)

K-L-K—See Kickhaefer Mfg. Co.

KICKHAEFER Mfg. Co., 199 Oregon St., Milwaukee, Wis. "K-L-K."

LINCOLN—See Lincoln Steering Device Co.

LINCOLN Steering Device Co., 1535 P St., Lincoln, Neb. "Lincoln."

LITL SHO-FUR—See White Mfg. Co.

LITTLE STEERSMAN—See Modern Auto Appliance Co.

LOCKWOOD-ASH Motor Co., 514 Horton St., Jackson, Mich. "L-A."

MILLER—See Safety Mfg. Co.

MILLER & Co., Spring Valley, Ill.

MODERN Auto Appliance Co., Chatham, N. Y. "Little Steersman."

Complete Index to Classification appears on Pages 28 to 32.

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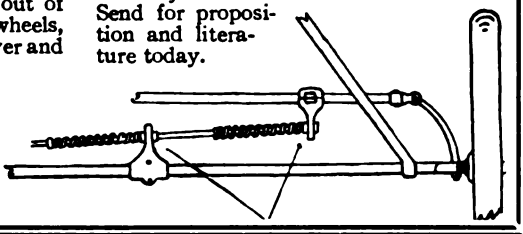
Take the Profits

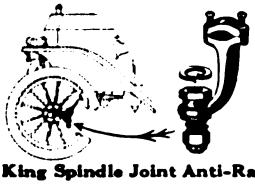
Safety First Steering Devices are selling everywhere. They take the "lost motion" out of the steering gear, steady the front wheels, stop wobble, reduce tire wear, last forever and sell for only $3.50 with no upkeep cost.

Put them on your demonstrators—your cars will handle better and sell more easily
Liberal discounts and exclusive territory to dealers.
Send for proposition and literature today.

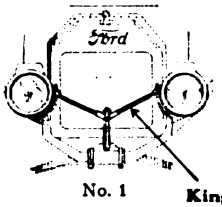


Auto Specialty Mfg. Co.
1207-1211-1215 G Avenue East
CEDAR RAPIDS IOWA

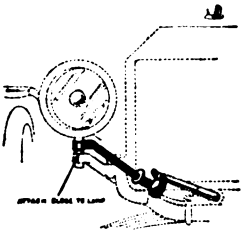
King Products



King Spindle Joint Anti-Rattler
Ford and Overland Cars



No. 1



No. 2

King Crank Holders
An Attractive Proposition to the Trade

KING SPECIALTY MFG. CO. 200 WASHINGTON STREET BROOKLINE, MASS.

THE

ACME

THE ACME STEERING CONTROLLER

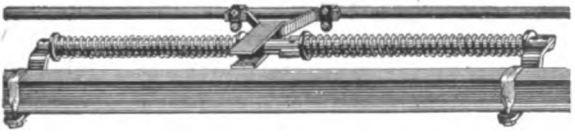
Is the only device offered to the jobber or dealer that is a **Positive Steering Control** for Ford Cars. It is complete in itself, does not disfigure the car, cannot get out of order and is easily attached.

Sales of this steering controller are increasing rapidly, and it gives entire satisfaction wherever sold.

The **Acme Steering Controller** is sold entirely through the jobber and dealer, and carries a very satisfactory discount.

Allow us to tell you more about it, or, send us your order.

ACME Steering Device Company
100 WINDSOR BUILDING
12th AND FILBERT STS.
PHILADELPHIA, PA.



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CHECKS (Continued)

STEERING GEAR CHECKS (Continued)

MODERN Specialty Co., 212 Fifth St., Racine, Wis. "Steer-Adius."

PAGE Woven Wire Fence Co., Adrian, Mich. "Saftsteer."

PERFEK Device Co., 2105-07 E. 15th St., Kansas City, Mo.

PHELPS, L. J., 3136 Homer St., Loma Portal, Cal.

PHILADELPHIA Auto Safety Steering Device Co., 1022 Arch St., Philadelphia, Pa.

ROUND ROBBIN—See V Air Valve & Mfg. Co.

ROUNDS & Co., C. C., Dows, Ia.

SAFETY Appliance Co., Baraboo, Wis. "Badger."

SAFETY Mfg. Co., Illinois State Bank Bldg., Quincy, Ill. "Miller."

SAFTSTEER—See Page Woven Wire Fence Co.

SAVIDGE Co., Tenth & Canal Sts., Indianapolis, Ind.

STEER-ADIUS—See Modern Specialty Co.

STEER-EZER—See Walker Mfg. Co.

TWIN-RIM Co., 103 Mass. Ave., Boston, Mass. (See page 633.)

V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo. "Round Robbin."

W-B—See Weiss-Bosley Sales Co.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis. "Steer-Ezer."

WEISS-BOSLEY Sales Co., 1411 Chestnut St., St. Louis, Mo. "W-B."

WHITE Mfg. Co., Bodmann Bldg., Cincinnati, O. "Litl Sho-Fur."

CLAMPS

HOOD CLAMPS OR FASTENERS

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

TOP BOW CLAMPS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

CLEANERS

WINDSHIELD CLEANERS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence. R. I. "Apco." (See page 607.)

CLOCKS

STEERING WHEEL CLOCKS

B-4-U—See Eisenstadt Mfg. Co.

EISENSTADT Mfg. Co., Olive & 12th Sts., St. Louis, Mo. "B-4-U."

COCKS

FUEL SUPPLY AND RESERVE COCKS

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

COILS

SPARK COILS

(See also Vibrators, Master)

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco." (See page 675.)

KINGSTON—See Kokomo Electric Co.

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

CONNECTIONS

RADIATOR CONNECTIONS

(See Hose Radiator)

TRAILER CONNECTIONS OR COUPLERS

BRICE Automatic Coupler Co., 1645 Hennepin Ave., Minneapolis, Minn.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

LITEHAUL—See Puffer-Hubbard Mfg. Co.

PUFFER-HUBBARD Mfg. Co., 26th & 32d Sts., S. Minneapolis, Minn. "Litehaul."

CONVERTERS

CHASSIS CONVERTERS

(For converting the Ford chassis for truck purposes)

AMES Motor Car Co., Owensboro, Ky.

AUTOMOBILE Mfg. & Eng. Co., Penobscot Bldg., Detroit, Mich.

CHAIN-TON-FORD Co., 632-40 N. Broad St., Philadelphia, Pa.

DEARBORN Motor Truck Co., 1250-54 S. Campbell Ave., Chicago, Ill.

DETROIT Truck Co., Detroit, Mich. "Tonford." (See page 869.)

FRANKLIN 2-Way Converter Co., Herald Bldg., Chicago, Ill.

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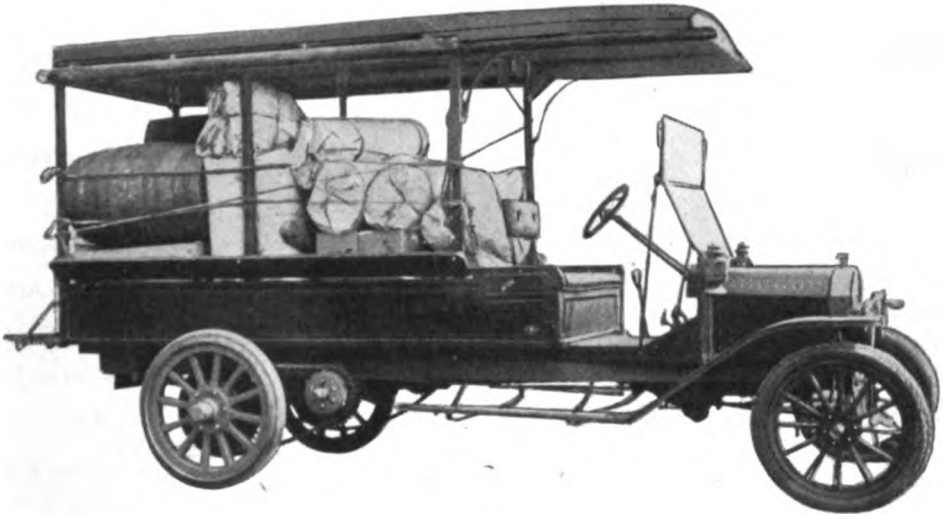
Rayford Unit

$300



The Super Offering
Brutally Strong
Novel Features

Our agency proposition is unique, get it.

The Rayford Company

3001-23 N. 2nd St. Philadelphia, Pa.

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CONVERTERS (Continued)

CHASSIS CONVERTERS (Continued)

HAYES Diefenderfer Co., 237 W. 55th St., New York, N. Y.

HUDFORD Co., 637 N. Broad St., Philadelphia, Pa.

IOWA Motor Truck Co., 313-17 E. Second St., Ottumwa, Ia.

JEWETT Car Co., Newark, O.
(See page 603.)

LONGFORD—See Motor-Accessory Distributing Co.

MAXFER Truck Co., 2023 Michigan Ave., Chicago, Ill.

MOTOR-Accessory Distributing Co., 87 Haverhill St., Boston, Mass. "Longford."
(See page 605.)

OLSON—See Swedish Crucible Steel Co.

RAYFORD Co., 3001-23 N. Second St., Philadelphia, Pa.
(See page 601.)

REDDEN Motor Truck Co., 16 W. 61st St., New York, N. Y.

ROTHWEILER & Co., 209 Broadway, N., Seattle, Wash.

SCOTT Machine Works, 1510 11th Ave., Seattle, Wash.

SIMPLEX Truckform Co., 115 S. Dearborn St., Chicago, Ill.

SMITH Form-A-Truck Co., 1470 S. Michigan Ave., Chicago, Ill.

SWEDISH Crucible Steel Co., Detroit, Mich. "Olson."

TONFORD—See Detroit Truck Co.

TON-FORD—See Woodward Truck Attachment Co.

TRUCK Attachment Co., Burke Bldg., Seattle, Wash.

TRUCTOR Mfg. Co., 1502 Michigan Ave., Chicago, Ill.

UNION Truck Mfg. Co., 250 W. 54th St., New York, N. Y.

WOODWARD Truck Attachment Co., 2035 W. Pico St., Los Angeles, Cal. "Ton-Ford."

XTEND-A-FORD Co., 1416 Wallace St., Philadelphia, Pa.

COVERS

HOOD COVERS

(See Covers, Radiator and Hood)

RADIATOR AND HOOD COVERS

AYRES & Sons, Wm., Cumberland & Fourth Sts., Philadelphia, Pa.

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

GLOBE Seat Cover Co., Racine, Wis.

HOPEWELL Bros., Watertown, Mass.
(See page 617.)

LADOW, Clinton, Asbury Park, N. J.

McCLELLAN, Chas. P., Fall River, Mass.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

PREMIER Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

WILCOX Co., M. I., Water St., Toledo, O.
(See page 805.)

SEAT COVERS

(See Covers, Slip)

SLIP COVERS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

AUTO Specialty Factory, 1010 Spring St., Cincinnati, O.

B. E. Mfg. Co., 444 Broadway, New York, N. Y.
(See page 205.)

BADGER—See Wisconsin Auto Top Co.

CHICAGO Seat Cover Co., 2546 Wabash Ave., Chicago, Ill.

DETROIT Slip Cover Co., 22 Hendrie Ave., Detroit, Mich.

ERO Mfg. Co., 408-16 W. Grand Ave., Chicago, Ill.

GATES Mfg. Co., 432 N. Capitol Ave., Indianapolis, Ind.

GLOBE Seat Cover Co., Racine, Wis.

LADOW, Clinton, Asbury Park, N. J.

LONDON Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

McCLELLAN, Chas. P., Fall River, Mass.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O.
(See page 207.)

PREMIER Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

UNIQUE Specialty Co., S. 17th St., Flushing, N. Y.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O.
(See page 211.)

WESTERN Auto Top Co., 1208-10 Jackson St., Omaha, Neb.

WISCONSIN Auto Top Co., 1517 17th St., Racine, Wis. "Badger."
(See page 531.)

TIRE COVERS

(See Cases, Tire)

TOP COVERS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill.
(See page 793.)

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

DONLIN Auto Co., C. A., Hopkins, Mo.

Complete Index to Classification appears on Pages 28 to 32.

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This

Jewett Attachment

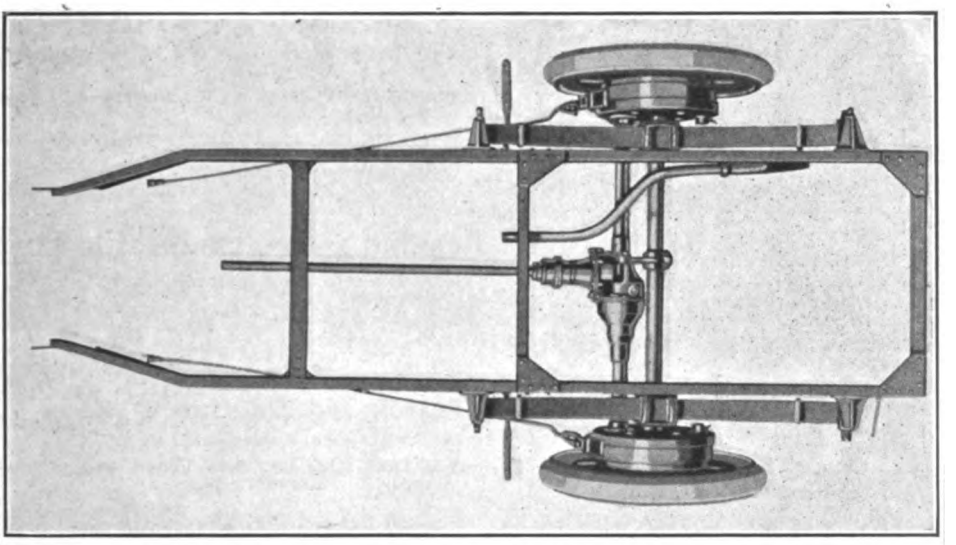
and a

Ford Chassis

will form

A One Ton Truck

Our attachment consists of an internal drive rear axle, heavy rear wheels with 34 x 3½ solid tires, drive shaft and universal joints, rear fenders, running boards, floor and front side boards, comprising everything necessary to convert a Ford chassis into a one-ton truck.



Can be assembled by anyone in a few hours' time.

This is the only attachment that includes everything necessary to form a complete truck.

No experiment but a tried-out mechanical success.

We give agents liberal discounts—write for prices and terms.

The Jewett Car Company

Newark, Ohio

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COVERS (Continued)

TOP COVERS (Continued)

GATES Mfg. Co., 431 N. Capitol Ave., Indianapolis, Ind.

HAWES Storm Front Co., 14 N. Monroe St., Coldwater, Mich.

LONDON Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y.
(See page 499.)

NIAGARA Fabric Mfg. Co., 526 W. 50th St., New York, N. Y.

PREMIER Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O.
(See page 211.)

VALVE COVERS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

TROY Auto Specialty Co., 2 Federal St., Troy, N. Y.

COWLS

DASH COWLS AND COWL BOARDS

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CONOVER—See Page Woven Wire Fence Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

MALCO—See Malton Specialty Co.

MALTON Specialty Co., 755 Boylston St., Boston, Mass. "Malco."
(See page 607.)

PAGE Woven Wire Fence Co., Adrian, Mich. "Conover."

RANDS Mfg. Co., Detroit, Mich.
(See page 637.)

VANGUARD Mfg. Co., Detroit, Mich.
(See page 455.)

WHETSTONE & Co., John H., Armstrong Bldg., Lapeer, Mich.

CRADLES

RADIATOR CRADLES

H & M—See Radius Rod Co.

MARTENS Co., E. A., Lafayette, Ind.

RADIUS Rod Co., Lamoni, Ia. "H & M."

W-B—See Weiss-Bosley Sales Co.

WEISS-BOSLEY Sales Co., 1411 Chestnut St., St. Louis, Mo. "W-B."

BODY CRADLES AND HOISTS

ECONOMY Body Lock & Cradle Co., 812 Hartford Bldg., Chicago, Ill.
(See page 861.)

CUPS

GREASE CUPS

(See Cups, Oil and Grease)

OIL AND GREASE CUPS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

BOWEN Mfg. Co., Auburn, N. Y. "Empress."
(See page 117.)

E. G.—See Grossman Mfg. Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EMPRESS—See Bowen Mfg. Co.

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass.
(See page 625.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

TUCKER, W. H. & C. F., Hartford, Conn.
(See page 193.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

SPRING LEAF LUBRICATING CUPS

BOWEN Mfg. Co., Auburn, N. Y.
(See page 117.)

BROWN Spring Oiler Co., 7007 Carnegie Ave., Cleveland, O.

GRUS Leaf Spring Oiler Co., 1536 Michigan Ave., Chicago, Ill.

JEAVONS—See S. & S. Mfg. & Sales Co.

MARVEL—See Mustee Mfg. Co.

MUSTEE Mfg. Co., 3003 Cedar Ave., Cleveland, O. "Marvel."

S. & S. Mfg. & Sales Co., 1227 Prospect Ave., S. E., Cleveland, O. "Jeavons"

CURTAINS

SPECIAL TOP CURTAINS

LINEAU Curtain & Equipment Co., Cleveland, O.

CUT-OUTS

MUFFLER CUT-OUTS

(See Valves, Muffler Cut-Out)

Complete Index to Classification appears on Pages 28 to 32.

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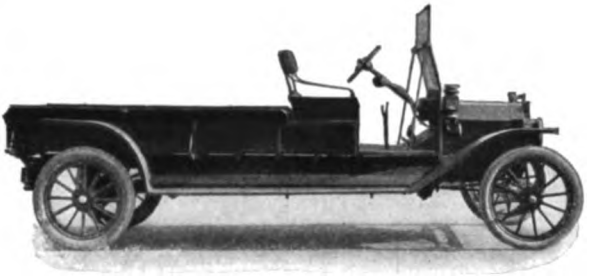
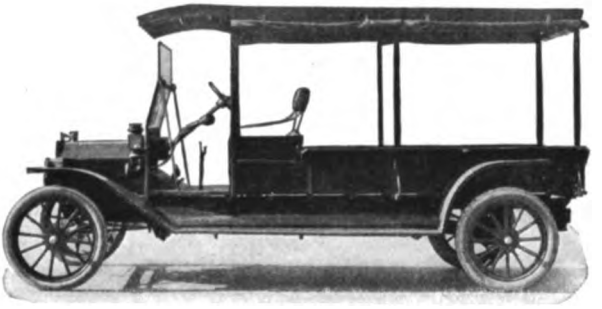
Original Patented Longford Auto Parts



OPEN EXPRESS



EXPRESS—With Canopy Top and Curtains

Converted Ford Cars into Light Trucks

NO BLACKSMITHING A SIMPLE ASSEMBLY

136 Inch Wheel Base

8 FEET OF LOADING SPACE BACK
OF DRIVERS' SEAT

Price Installed $125.00

CORRESPONDENCE SOLICITED

Motor-Accessory Distributing Company

87 HAVERHILL STREET, BOSTON, MASS.

Longford

WANTED—LIVE DEALERS IN OPEN TERRITORIES

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DEFLECTORS

EXHAUST DEFLECTORS

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

HEAT DEFLECTORS

FRANKLIN Rubber Co., 134 Federal St., Boston, Mass.

HOME Light Co., 3353 Milwaukee Ave., Chicago, Ill.

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto."
(See page 257.)

PRESTO—See Metal Specialties Mfg. Co.

DIMMERS

HEADLIGHT DIMMERS OR SHADES

MORTON Colorlight Co., 152 Bridge St., Springfield, Mass.
(See page 607.)

O-U-LITE Co., Racine, Wis.
(See page 761.)

DYNAMOS

ELECTRIC LIGHTING DYNAMOS

APELCO—See Apple Electric Co.

APPLE Electric Co., Newark, N. J. "Apelco."

CARLETON Co., 170 Summer St., Boston, Mass.

DETROIT Starter Co., Detroit, Mich.
(See page 867.)

DYNETO Electric Co., Syracuse, N. Y.
(See page 487.)

EUREKA—See Henricks Magneto & Electric Co.

FISHER Electrical Works, 32 Lynn St., Detroit, Mich.

GENEMOTOR—See Picard & Co.

GRAY & Davis, Boston, Mass.
(See pages 483 to 486.)

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

HENDRICKS Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind. "Eureka."
(See page 651.)

HOLTZER-CABOT Electric Co., Roxbury, Mass. "J-S."

HUFF—See Simms Magneto Co.

J-S—See Holtzer-Cabot Electric Co.

JACKSON Co., Chas. A., 222 Elliott St., Boston, Mass.

KEMCO Electric Mfg. Co., 2228 Ashland Rd., Cleveland, O.

PICARD & Co., A. J., 1720-22 Broadway, New York, N. Y. "Genemotor."

SIMMS Magneto Co., East Orange, N. J. "Huff."
(See page 627.)

TECO—See Tritt Electric Co.

TRITT Electric Co., Union City, Ind. "Teco."

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

XCEL-O-LYTE Co., Newton, Ia.

ECONOMIZERS

FUEL ECONOMIZERS

(See Mixers, Fuel)

EQUALIZERS

BRAKE EQUALIZERS

CROSS Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich.
(See page 609.)

EXTENDERS

LAMP BRACKET EXTENDERS

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

FANS

RADIATOR FANS

HOTZ Foundry & Mfg. Co., Fremont, O.

PITTER Fan Co., 1842 Peoples Gas Bldg., Chicago, Ill.
(See page 273.)

FASTENERS

BOW FASTENERS

(See Clamps, Top Bow)

HOOD FASTENERS

(See Clamps, Hood)

VENTILATING HOOD FASTENERS

V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo.

FENDERS

FENDERS OR MUD GUARDS

(See Guards, Mud)

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APEX Electric Mfg. Co., 1410 W. 59th St., Chicago, Ill. "Fillometer."

BADGER Craft Shops, Sheboygan, Wis.

BOSTON Auto Gage Co., S-12 Waltham St., Boston, Mass. "Challenge." (See page 241.)

CHALLENGE—See Boston Auto Gage Co.

DAVENPORT—See Wheeler-Sheerin Co.

DEPENDO—See Roper & Co.

FILLOMETER—See Apex Electric Mfg. Co.

GEM Stamped Steel Co., Chelsea, Mass. (See page 479.)

GIBFORD, Edward B., Adrian, Mich.

MODERN Specialty Co., 212 Fifth St., Racine, Wis.

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

OFFICIAL—See Ritz-Woller Co.

PFAHL Gauge & Mfg. Co., Akron, O.

REEPS Mfg. Co., 50 Church St., New York, N. Y.

RETLAW Mfg. Co., 654-58 Franklin St., Detroit, Mich.

RITZ-WOLLER Co., Oliver C., 160 N. Fifth Ave., Chicago, Ill. "Official."

ROCHESTER Mfg. Co. (Brighton Station), Rochester, N. Y. (See page 839.)

ROPER & Co., C. F., Hopedale, Mass. "Dependo."

ROTHWEILER & Co., 209 Broadway, N., Seattle, Wash.

WEISS Mfg. Co., Torrington, Conn.

WHEELER-SHEERIN Co., 238 Massachusetts Ave., Indianapolis, Ind. "Davenport."

WHITE Motor Device Co., Mansfield, O.

OIL GAGES

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

BELL Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.

BENFORD Mfg. Co., Box H., Mt. Vernon, N. Y. "Monarch." (See page 695.)

BILLINGER Mfg. Co., Saranac, Mich.

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

CB—See Cumings Bros.

CLIMAX Electric Works, New Salem, Mass.

COCHRAN Pipe Wrench Mfg. Co., 7545 S. Chicago Ave., Chicago, Ill.

CUMINGS Bros., Flint, Mich. "CB."

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

E. G.—See Grossman Mfg. Co.

FERGUSON, D. E., Vernon, Mich.

FREEMAN Brass Works, 92 Bowery, New York, N. Y.

GAHM & McCormick Co., 803 E. Main St., Streator, Ill.

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HENKELMAN Co., Chas. E., 2213-15 Pacific Ave., Atlantic City, N. J.

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

IDEAL—See Worthington, A. P.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MOSLER & Co., A. R., Mt. Vernon, N. Y.

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

PRESBREY Co., E. H., 432 Fourth Ave., New York, N. Y. (Distributors.) (See page 807.)

REEPS Mfg. Co., 50 Church St., New York, N. Y.

RETLAW Mfg. Co., 654-58 Franklin St., Detroit, Mich.

ROTHWEILER & Co., 209 Broadway, N. Seattle, Wash.

TROY Auto Specialty Co., 2 Federal St., Troy, N. Y.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WORTHINGTON, A. P., 1217 San Pedro St., Los Angeles, Cal. "Ideal."

GASKETS

CYLINDER HEAD AND VALVE CAP GASKETS

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Never-Leak." (See page 685.)

McCORD Mfg. Co., Detroit, Mich. (See pages 418 and 419.)

NEVER-LEAK—See Fitzgerald Mfg. Co.

VICTOR Mfg. & Gasket Co., Troy & 21st Sts., Chicago, Ill. (See page 455.)

FELT GASKETS

ADVANCE Felt Specialty & Cutting Co., 159 W. Harrison St., Chicago, Ill. (See page 853.)

ALGCO—See Auburn Leather Goods Co.

AUBURN Leather Goods Co., Auburn, N. Y. "Algco." (See page 309.)

BOOTH Felt Co., Detroit, Mich. (See page 563.)

BRAWLEY, T. R., 85-87 Adams St., Brooklyn, N. Y. (See page 567.)

GEARS

AUXILIARY TRANSMISSION GEARS

HESS-SCOTT—See Truck Attachment Co.

TRUCK Attachment Co., Burke Bldg., Seattle, Wash. "Hess-Scott."

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Best Advertised Racer Body for Ford Cars

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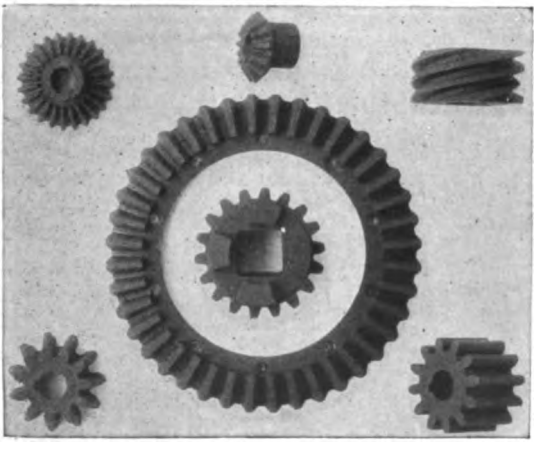

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DIFFERENTIAL GEARS

AUTOMOBILE Specialty Co., 999 Woodward Ave., Detroit, Mich.

BAILEY—See Gearless Differential Co.

GEARLESS Differential Co., 876 Woodward Ave., Detroit, Mich. "Bailey."

M & S Gear Co., 166 Lycaste St., Detroit, Mich.
(See page opposite Title Page.)

SPECIAL RATIO REAR BEVELS

CROSS Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich.
(See page 609.)

DETROIT Radiator & Specialty Co., 963 Woodward Ave., Detroit, Mich.

NOONAN, D. R., W. Washington St., Paris, Ill.

PURITAN Machine Co., 410 Lafayette Blvd., Detroit, Mich.

STEERING GEARS

MOYER Motor Engineers, St. Paul, Minn.

TRANSMISSION GEARS

(See Transmissions, Sliding Gear)

GENERATORS

ELECTRIC LIGHTING GENERATORS

(See Dynamos, Electric Lighting)

GUARDS

MUD GUARDS OR FENDERS

AUTOMOBILE Specialty Co., 999 Woodward Ave., Detroit, Mich.

CHICAGO Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill.

CORCORAN Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

HAYES Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D, Cincinnati, O. "Lawco."
(See page 617.)

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

MICHIGAN Crown Fender Co., 101 Cross St., Ypsilanti, Mich.
(See page 611.)

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

GUIDES

BRAKE ROD GUIDES

(See Supports, Brake Rod.)

FAN BELT GUIDES

ANGIERS, Streator, Ill. "Kant Kum Off."

HOME Light Co., 3353 Milwaukee, Ave., Chicago, Ill.

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

KANT KUM OFF—See Angiers.

PEDERSEN Lubricator Co., 636 First Ave., New York, N. Y. "Stay-On."

STAY-ON—See Pedersen Lubricator Co.

GUNS

GREASE AND OIL GUNS

LACO—See Lubricating Accessories Co.

LUBRICATING Accessories Co., Paterson, N. J. "Laco."
(See page 611.)

OIL GUNS

(See Guns, Grease and Oil.)

HANDLES

EMERGENCY BRAKE LEVER HANDLES

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

GROUT Extension Arm Co., Riverside Ave., Derby, Vt.

HEADLIGHTS

ELECTRIC HEADLIGHTS

(See Lamps, Electric Head.)

HEATERS

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AUTO-RAD—See Brevando Mfg. Co.

BREVANDO Mfg. Co., Arlington Bldg., Rochester, N. Y. "Auto-Rad."

BRICKEY Auto Heater Co., Valley City, N. Dak.

McCLINTOCK, Edward, 221 S. Fifth St., Minneapolis, Minn.

OTTOFY Auto Heater Co., 2652 Locust St., St. Louis, Mo.

PERFECTION-SPRING Service Co., 2002 E. 65th St., Cleveland, O.
(See page 267.)

MIXTURE HEATERS

(See also Mixers, Fuel; Also Primers' Engine.)

COOPER Mfg. Co., F., New Rockford, N. Dak.

E. G.—See Grossman Mfg. Co.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

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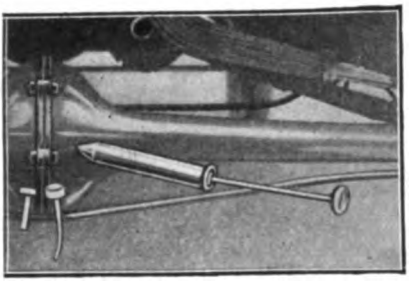
LACO OIL AND GREASE GUNS



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Works equally well with the heaviest greases and the finest oils.

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Cork Plungers to replace worn out packing 5c

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Universal Crown Fenders

(THE 10 INCH WIDE KIND)

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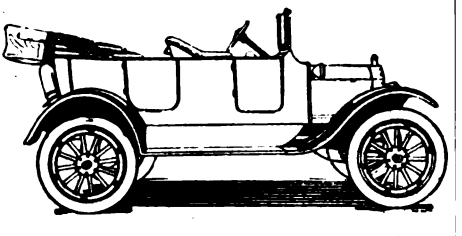

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BELT HOLDERS

(See Guides, Fan Belt)

CRANK HOLDERS

(See Holders, Starting Crank)

LICENSE HOLDERS

AFFA—See Graffam & Co.

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger." (See page 865.)

B. L. B. Mfg. Co., 864 Woodward Ave., Detroit, Mich.

BADGER—See Auto Parts Mfg. Co.

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

E. G.—See Grossman Mfg. Co.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

FORD-Clark Co., 3125 Perkins Ave., Cleveland, O. (See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GRAFFAM & Co., W. S., 85 Locust St., Northampton, Mass. "Affa."

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NEVEROUT—See Rose Mfg. Co.

OAKES Co., Dept. A., Indianapolis, Ind. (See page 223.)

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

SAFETY Mfg. Co., Illinois State Bank Bldg., Quincy, Ill.

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco." (See page 613.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

SPARE TIRE HOLDERS

AGNER Co., Raymond C., Burlington, Wis.

AMERICAN Auto Specialty Co., 20 W. Third St., Peru, Ind. "Asco."

APCO—See Auto Parts Co.

ASCO—See American Auto Specialty Co.

ATTWOOD Brass Works, Grand Rapids, Mich. (See page 443.)

AUTO Forge Sales Co., 30 King Ave., Columbia, O.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger." (See page 865.)

BADGER—See Auto Parts Mfg. Co.

BEST—See Oltmanns-Kunkle Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CONNECTICUT Steel & Wire Co., 57-61 Allyn St., Hartford, Conn. "Standard."

DUPLEX—See International Stamping Co.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

E. G.—See Grossman Mfg. Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HALLADAY Co., L. P., Streator, Ill.

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

INTERNATIONAL Stamping Co., 400-12 N. Leavitt St., Chicago, Ill. "Victor," "Duplex," "Simplex."

LECOMPTE Co., Geo. W., 33 Warren St., New York, N. Y. (See page 613.)

McKINNON Dash Co., 252 Amherst St., Buffalo, N. Y.

MASCO—See Milwaukee Auto Specialty Co.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

OLTMANNS-KUNKLE Co., 607-09 Franklin St., Peoria, Ill. "Best."

PACKER Auto Specialty Co., 122 S. Michigan Ave., Chicago, Ill. "Ray."

RAY—See Packer Auto Specialty Co.

RICHARDS-WILCOX Mfg. Co., Aurora, Ill.

SIMPLEX—See International Stamping Co.

SLY Mfg. Co., W. W., Cleveland, O.

STANDARD—See Connecticut Steel & Wire Co.

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco." (See page 613.)

VICTOR—See International Stamping Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill. (See page 817.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

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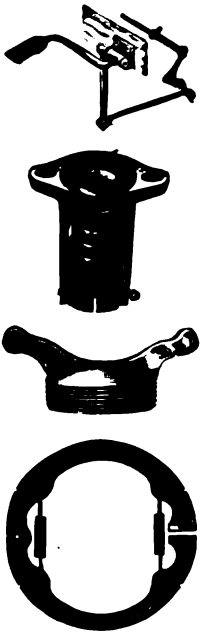
LE COMPTE



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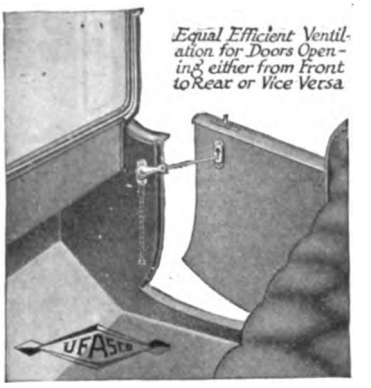

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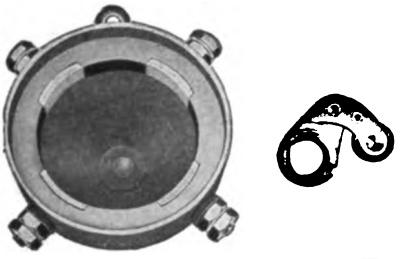

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AFFA—See Graffam & Co.

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

B. E. Mfg. Co., 444 Broadway, New York, N. Y. (See page 205.)

BANTLIN Co., Julius J., 216 E. Third St., Cincinnati, O. (See page 583.)

BERRY Garage, Gray, Me.

BOWEN Mfg. Co., Auburn, N. Y. (See page 117.)

G. & K.—See Graton & Knight Mfg. Co.

GIVEN & Son Co., R., Sidney, O.

GRAFFAM & Co., W. S., 85 Locust St., Northampton, Mass. "Affa."

GRATON & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 103.)

HOOVER Co., W. H., New Berlin, O.

KING Specialty Mfg. Co., 200 Washington St., Brookline, Mass. (See page 599.)

OAKES Co., Dept. A., Indianapolis, Ind. (See page 223.)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. (See page 207.)

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco." (See page 613.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

TIRE HOLDERS

(See Holders, Spare Tire)

WATCH HOLDERS

NOE, Seaman P., Asbury Park, N. J.

HOODS

MOTOR HOODS

CANDLER Radiator Co., Detroit, Mich. (See page 423.)

CORCORAN Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

DUPLEX Auto Hood Corp., 154 E. 36th St., New York, N. Y.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 617.)

LIVINGSTON Radiator & Mfg .Co., 311 W. 75th St., New York, N. Y. (See page 631.)

METAL Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

NATIONAL Can Co., Detroit, Mich. (See page 629.)

OSPECO Mfg. Co., 572-80 Franklin St., Detroit, Mich.

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

SVENSGAARD Sales Corp., Harry, 214 Jefferson Ave., Detroit, Mich. (See page 615.)

UNIVERSAL Specialty Mfg. Co., Leader Bldg., Cleveland, O.

RADIATOR HOODS

CHICAGO Mfg. Co., 1453-64 Michigan Ave., Chicago, Ill.

CORCORAN Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

DUPLEX Auto Hood Corp., 154 E. 36th St., New York, N. Y.

OSPECO Mfg. Co., 572-80 Franklin St., Detroit, Mich.

SVENSGAARD Sales Corp., Harry, 214 Jefferson Ave., Detroit, Mich. (See page 615.)

UNIVERSAL Specialty Mfg. Co., Leader Bldg., Cleveland, O.

HORNS

BULB HORNS

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y.

ELECTRIC HORNS

AUTOMOBILE Supply Mfg. Co., 220 Taaffe Pl., Brooklyn, N. Y.

BENJAMIN Electric Mfg. Co., 120 S. Sangamon St., Chicago, Ill.

CLERO—See Fitzgerald Mfg. Co.

DUPLEX Electric Mfg. Co., Pittsburgh, Pa. "Safeguard."

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Clero." (See page 685.)

HECO—See Heinze Electric Co.

HEINZE Electric Co., Lowell, Mass. "Heco." (See page 675.)

HI-LO—See Premier Electric Co.

KLAXET—See Lovell-McConnell Mfg. Co.

KLAXONET—See Lovell-McConnell Mfg. Co.

LOVELL-McCONNELL Mfg. Co., Newark, N. J. "Klaxonet," "Klaxet." (See page 281.)

PIEL Co., G., 13th St. & Boulevard, Long Island City, N. Y.

PREMIER Electric Co., 4053 Ravenswood Ave., Chicago, Ill. "Hi-Lo." (See page 559.)

SAFEGUARD—See Duplex Electric Mfg. Co.

SPARKS-WITHINGTON Co., Jackson, Mich.

ENGINE OPERATED HORNS

BEARTONE—See Oakes Co.

MALCO—See Malton Specialty Co.

MALTON Specialty Co., 755 Boylston St., Boston, Mass. "Malco." (See page 607.)

Complete Index to Classification appears on Pages 28 to 32.

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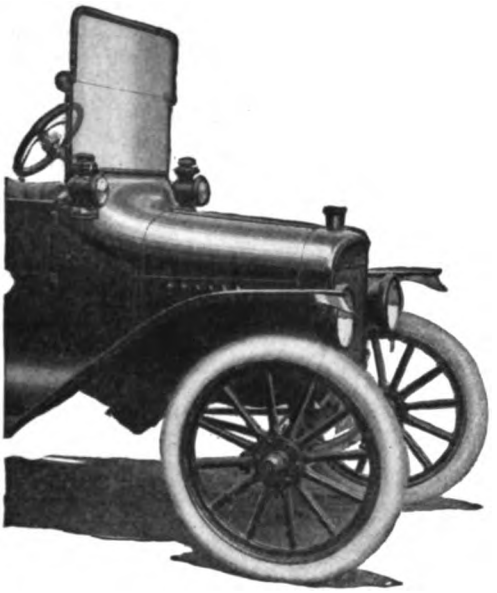

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HORNS (Continued)

ENGINE OPERATED HORNS (Continued)

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O. (See page 775.)

OAKES Co., Dept. A., Indianapolis, Ind. "Beartone." (See page 223.)

ROCHESTER Mfg. Co. (Brighton Station), Rochester, N. Y. (See page 839.)

EXHAUST HORNS

AERMORE—See Fulton Co.

AGNER Co., Raymond C., Burlington, Wis. "Simplex."

AHCO—See Arnold-Hough Co.

APCO—See Auto Parts Co.

ARNOLD-HOUGH CO., 124 Washington St., Providence, R. I. "Ahco."

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

BARCO Brass & Joint Co., 212-22 W. Illinois St., Chicago, Ill.

BUELL Mfg. Co., 1806 S. Michigan Blvd., Chicago, Ill. (See page 791.)

CLIMAX Electric Works, New Salem, Mass.

CRUM-WILEY Mfg. Co., Peru, Ind.

FOGG—See Randall-Faichney Co.

FULTON Co., 708-10 National Ave., Milwaukee, Wis. "Aermore." (See page 695.)

INTERNATIONAL Automobile Supply Co., 117 W. South Water St., Chicago, Ill. "Victor."

JERICHO—See Randall-Faichney Co.

JUBILEE—See Randall-Faichney Co.

McCLINTOCK, Edward, 221 S. Fifth St., Minneapolis, Minn.

MINERVA Hardware Mfg. Co., Minerva, O.

RANDALL-FAICHNEY Co., 76 Atherton St., (Jamaica Plain), Boston, Mass. "Fogg," "Jericho," "Jubilee."

SIMPLEX—See Agner Co.

VICTOR—See International Automobile Supply Co.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill. (See page 817.)

FAN HORNS

(See Horns, Engine Operated)

MECHANICAL HORNS

AUTOMOBILE Supply Mfg. Co., 220 Taaffe

CLERO—See Fitzgerald Mfg. Co. Pl., Brooklyn, N. Y. "Handphone."

DUPLEX Electric Mfg. Co., Pittsburg, Pa. "Safeguard."

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn. "Clero." (See page 685.)

HANDPHONE—See Automobile Supply Mfg. Co.

KLAXON—See Lovell-McConnell Mfg. Co.

KLAXONET—See Lovell-McConnell Mfg. Co.

LOVELL-McCONNELL Mfg. Co., Newark, N. J. "Klaxon," "Klaxonet." (See page 281.)

PIEL Co., G., 13th St. & Boulevard, Long Island City, N. Y.

SAFEGUARD—See Duplex Electric Mfg. Co.

SPARKS-WITHINGTON Co., Jackson, Mich.

STANDARD Auto Horn, Somerville, Mass. (See page 277.)

STEWART-WARNER Speedometer Corp., Chicago, Ill. (See page 461.)

HOSE

RADIATOR CONNECTING HOSE

BEAVER—See Mechanical Rubber Co.

CINCINNATI Rubber Mfg. Co., Cincinnati, O. (See page 763.)

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill. "Beaver."

THERMOID Rubber Co., Trenton, N. J. (See pages 81 and 289.)

VOORHEES Rubber Mfg. Co., Jersey City, N. J.

INDICATORS

CARBURETER ADJUSTMENT INDICATORS

S & B—See Schoener Mfg. Co.

SCHOENER Mfg. Co., St. Cloud, Minn. "S & B."

WHITTELSEY Co., 17 Battery Pl., New York, N. Y.

JACKS

SPECIAL JACKS

(Wheeled, Two and Four Wheel Lifting, Etc.)

BONE & Tucker Co., Chicago, Ill. "Quick Easy."

QUICK EASY—See Bone & Tucker Co.

TIRE SAVING JACKS

(For holding car off the floor when not in use).

M. B.—See Metzig Bros.

METZIG Bros., 321 Broadway, Berlin, Wis. "M. B."

PAGE Woven Wire Fence Co., Adrian, Mich.

ST. LOUIS Malleable Casting Co., 7800 N. Broadway, St. Louis, Mo.

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. (See page 653.)

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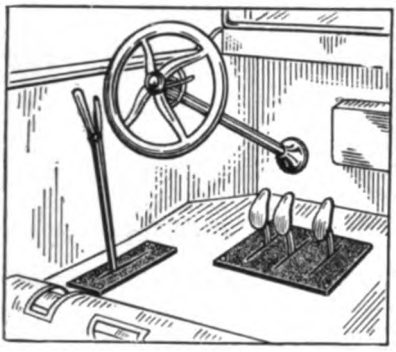
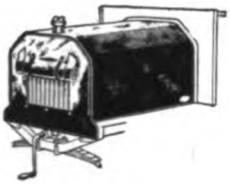


BRAKE MATS FOR FORD CARS



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Wash Aprons
34x44 gum drill $1.20
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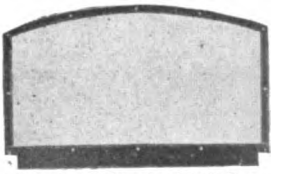
Fan Belts for Fords, Genuine leather, easily applied, 50c.



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JIGS

CONNECTING ROD BABBITTING JIGS

HANTEN Machine Co., Watertown, S. Dak.
(See page 619.)

HONN, Peter, 578 Stocking Ave., Grand Rapids, Mich.

LAMPS

ELECTRIC DASH LAMPS

ARGON—See Wood Mfg. Co.

B. & L. Auto Lamp Co., 534-50 W. 58th St., New York, N. Y.
(See page 293.)

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.)
(See pages 300 and 301.)

CAMPBELL Co., A. S., 284 Commercial St., Boston, Mass. "Cello."

CELLO—See Campbell Co.

CULVER-STEARNS Mfg. Co., Detroit, Mich.
(See page 699.)

EXCELITE—See Newfield Silver Mfg. Co.

GUIDE Motor Lamp Mfg. Co., Cleveland, O.
(See page 291.)

INDIANA Lamp Co., Connersville, Ind.
(See pages 446 and 447.)

KILBORN-SAUER Co., Fairfield, Conn.
(See page 293.)

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto."
(See page 257.)

NEWFIELD Silver Mfg. Co., State & Ash Sts., Bridgeport, Conn. "Excelite."

PRESTO—See Metal Specialties Mfg. Co.

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

WOOD Mfg. Co., Dept. M., Fairfield, Conn. "Argon."
(See pages 300, 301 and 857.)

ELECTRIC HEAD LAMPS

B. & L. Auto Lamp Co., 534-50 W. 58th St., New York, N. Y.
(See page 293.)

CORCORAN-VICTOR Co., Cincinnati, O.
(See page 507.)

CULVER-STEARNS Mfg. Co., Detroit, Mich.
(See page 699.)

GRAY & Davis, Boston, Mass.
(See pages 483 to 486.)

GUIDE Motor Lamp Mfg. Co., Cleveland, O.
(See page 291.)

INDIANA Lamp Co., Connersville, Ind.
(See pages 446 and 447.)

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

VICTOR Auto Parts Co., Second & Elm Sts., Cincinnati, O.

LATCHES

EMERGENCY BRAKE LATCHES

(See Handles, Emergency Brake)

LEVERS

EMERGENCY BRAKE LEVERS

N. Y. Motor Car Device Co., 299 11th Ave., New York, N. Y. "Premo."

PREMO—See N. Y. Motor Car Device Co.

LIGHTERS

ELECTRIC CIGAR LIGHTERS

METAL Specialties Mfg. Co., 736-38 W. Monroe St., Chicago, Ill. "Presto."
(See page 257.)

PRESTO—See Metal Specialties Mfg. Co.

LIGHTS

CURTAIN LIGHTS

ARSENAL Varnish Co., 25th St. & Fourth Ave., Rock Island, Ill.

AUTO Specialty Factory, 1010 Spring St., Cincinnati, O.

FAIRMANCO—See Fairmont Mfg. Co.

FAIRMONT Mfg. Co., (Brighton Station), Cincinnati, O. "Fairmanco."

PETERS & Herron Dash Co., Columbus, O.
(See page 617.)

LINING

BRAKE LINING

(See Banding, Brake)

TRANSMISSION BAND LINING

(See Banding, Brake)

LINKS

STEERING LINKS

CINCINNATI Ball Crank Co., Cincinnati, O.
(See page 183.)

LOCKS

CRANK LOCKS

(See Locks, Starting Crank)

DEMOUNTABLE BODY LOCKS

ECONOMY Body Lock & Cradle Co., 812 Hartford Bldg., Chicago, Ill.
(See page 861.)

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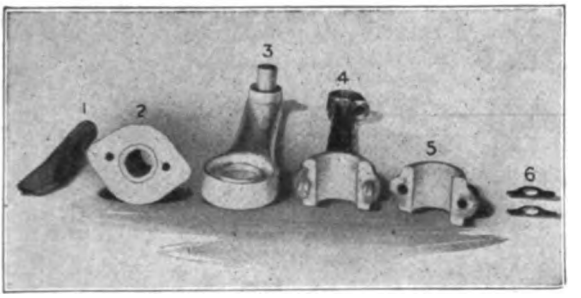

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Brake Lining, Clutch Facing, Multiple Disc Clutch Rings

Combination Auto Lock

A practical lock at a practical price. Simple in construction and positive in operation—can be operated in the dark and with gloves on. A combination lock with three hundred and twenty-four changes possible and easily effected in two seconds. The combination cannot be determined by touch, as some combinations, as the dummies appear to the touch the same as opening notches. The opening handles, one on each side, produce a distinctly audible click, thus making opening easy even in the dark. Merely count the clicks. One handle may be left at opening point and other off the opening point, thus making opening very easy and quick. Made of brass and steel; cannot be broken without seriously damaging the steering post; easily attached; out of the way when not used and has no parts to interfere with operation of car or to jingle when it is in motion. *Retail price $1.50*

Safety First Starting Cranks

are the only practical anti-backfire cranks on the market. Their construction is simple and price so low that they can be adopted as standard equipment. Carried in stock for Fords and Commercial cars. Black Japan finish—no parts to rust, springs to wear out, and made in either permanent or detachable styles. Give crank attaching details when ordering and we will submit cranks adapted to your requirements. Price $3.50, or $42.00 per dozen

The Madizan Tire Pump

will interest motorcycle dealers and garages handling this line. The only power-driven motorcycle tire pump on the market. Not a spark plug pump, but a real power-driven pump. Retail price, $5.00. For all standard machines, attachable in two minutes, and can be carried in the toolbox. *Further particulars on application.*

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LOCKS (Continued)

PEDAL LOCKS

COMMERCIAL Mfg. Co., 405 Commercial Bldg., Cleveland, O. (See page 319.)

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

LEE Hardware Co., Salina, Kans.

REAR COMPARTMENT LOCKS

PERFECT—See Stewart Specialty Co.

STEWART Specialty Co., 79 E. Chestnut St., Columbus, O. "Perfect." (See page 671.)

SPARK AND THROTTLE LEVER LOCKS

ADAMS, Alden L., 18 Ormond St., Springfield, Mass.

B. & E. Lock Co., 318 Seventh St., Des Moines, Ia.

BACKUS Novelty Co., 612 Water St., Smethport, Pa.

CLINTON Wire Cloth Co., Clinton, Mass.

FORDLOC—See Slaymaker Lock Mfg. Corp.

FORDLOC Sales Agency, Free Press Bldg., Detroit, Mich.

HANDEE—See Racine Handy Mfg. Co.

RACINE Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee." (See page 621.)

SLAYMAKER Lock Mfg. Corp., 808-70 First St., Lancaster, Pa. "Fordloc."

STEWART Specialty Co., 79 E. Chestnut St., Columbus, O. (See page 671.)

STURR Auto Lock Co., 9 View Pl. (Mt. Auburn), Cincinnati, O.

STARTING CRANK LOCKS

AFFA—See Graffam & Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

BRIDGES—See Cochran Pipe Wrench Mfg. Co.

COCHRAN Pipe Wrench Mfg. Co., 7544 S. Chicago Ave., Chicago, Ill. "Bridges."

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GRAFFAM & Co., W. S., 85 Locust St., Northampton, Mass. "Affa."

HANDEE—See Racine Handy Mfg. Co.

KRANKLOCK—See Oakes Co.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

OAKES Co., Dept. A., Indianapolis, Ind. "Kranklock." (See page 223.)

RACINE Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee." (See page 621.)

STEERING GEAR LOCKS

DEITZ Carburetor Co., 416 W. Fourth Ave., Denver, Colo.

HUNTER Auto Supply Co., 4101 E. Ravenswood Ave., Chicago, Ill.

MUDD Auto Lock Co., 118-24 S. Clinton St., Chicago, Ill. "Rajo."

NEVILLE Steering Wheel & Mfg. Co., 74 Congress St., W., Detroit, Mich.

RAJO—See Mudd Auto Lock Co.

RELIANCE Co., 428 W. 38th St., Chicago, Ill.

THROTTLE LEVER LOCKS

(See Locks, Spark and Throttle Lever)

LUBRICATORS

SPECIAL LUBRICATORS AND OIL PUMPS

AUTOMATIC Oiling System Co., 922 Howell St., Seattle, Wash.

BROWN Co., 218 Bellevue Ave., Syracuse, N. Y.

DANVER Accessory Co., Pawtucket, R. I.

EVAPCO Mfg. Co., 429 Grand River Ave., Detroit, Mich. (See pages 337 and 338.)

JUNIOR—See Pedersen Lubricator Co.

MARTENS Co., E. A., Lafayette, Ind.

NEW York Coil Co., 344 Pearl St., New York, N. Y. (See page 635.)

PEDERSEN Lubricator Co., 636 First Ave., New York, N. Y. "Junior."

PERKINS Mfg. Co., Des Moines, Ia. "Strong." (See page 578.)

STRONG—See Perkins Mfg. Co.

SPRING LEAF LUBRICATORS

(See Cups, Spring Leaf Lubricating)

LUGS

TRANSMISSION BAND LUGS

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MAGNETOS

IGNITION MAGNETOS

BOSCH Magneto Co., 223 W. 46th St., New York, N. Y.

EISEMANN Magneto Co., 32-33d St., Brooklyn, N. Y. (See page 327.)

SPLITDORF Electrical Co., Newark, N. J.

MANIFOLDS

SPECIAL AND JACKETED MANIFOLDS

ECONOMY Manifold Co., 1065 S. Clinton St., Syracuse, N. Y.

WHITE Motor Device Co., Mansfield, O.

WILMO Co., 708 Fulton St., Chicago, Ill.

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"HANDEE"

LINE OF

AUTOMOBILE ACCESSORIES

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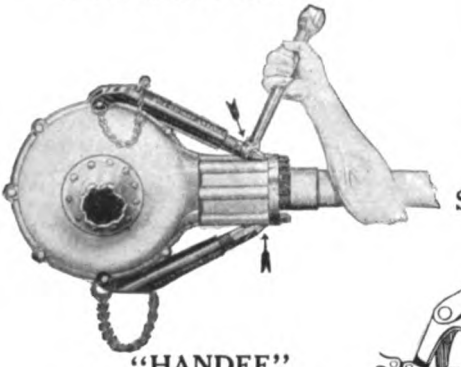
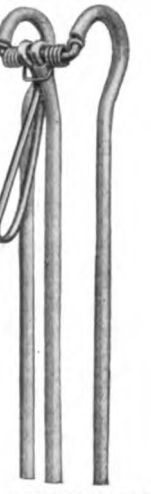
"HANDEE" Pick Up Pliers

"HANDEE" Wind Shield Cleaner



"HANDEE" Rear Housing Puller



"HANDEE" Wind Shield Cleaner

"HANDEE" Sprocket Chain Clamp

Mechanical Starters
Shock Absorbers
Crank Locks
Rear Housing Pullers
Steersman
Robe Rail Locks
Pick Up Pliers
Sprocket Chain Clamps
Wind Shield Cleaners

Manufactured by

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Office: 107 5th St.
RACINE, WIS. U. S. A.

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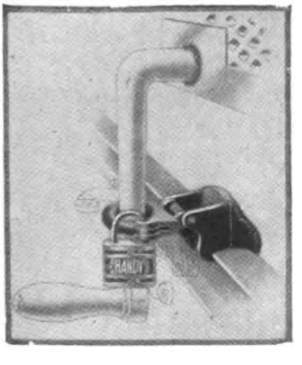

"HANDEE" Auto Crank Lock

"HANDEE" Auto Robe Rail Lock

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MATS

FLOOR BOARD MATS

FEDERAL Rubber Co. (Cudahy), Milwaukee, Wis.

GOODRICH Co., B. F., Akron, O.

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

MAYO & Co., F. A., Boston, Mass.

MECHANICAL Rubber Co., 307 W. Randolph St., Chicago, Ill.

SPIRO Mfg. Co., 68-72 E. 131st St., New York, N. Y. "Uniq."

UNIQ—See Spiro Mfg. Co.

METERS

HEAT INDICATING METERS AND RADIATOR THERMOMETERS

BOYCE Motometer—See Motometer Co.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill. "Radiometer."

MOTOMETER Co., 15 Wilbur Ave., Long Island City, N. Y. "Boyce Motometer." (See page 809.)

RADIOMETER—See Edelmann & Co.

ROBINSON Mfg. Co., J. E., 504 W. Van Buren St., Chicago, Ill.

MAGNETO METERS

EECO—See Electric Equipment Co.

ELECTRIC Equipment Co., 1152 S. Grand Ave., Los Angeles, Cal. "Eeco."

HOYT Electrical Instrument Works, Penacook, N. H. (See page 623.)

ST. LOUIS Electrical Works, 5410 Easton Ave., St. Louis, Mo.

WILLIAMS, E. Q., 535-39 S. Clinton St., Syracuse, N. Y.

MIXERS

FUEL MIXERS AND AUXILIARY AIR VALVES

(See also Heaters, Mixture; Also Primers, Engine)

ALBRECHT-INGRAHAM Co., 303 S. Third St., Minneapolis, Minn.

AUTOMATIC Carburetor Co., 2021 Michigan Ave., Chicago, Ill. (See page 341.)

BURNOX Co., 6324 Greenfield Ave. (W. Allis), Milwaukee, Wis. "Hunt."

CLEMMER, G. H., West Alexandria, O.

CRONE, F. G., 334 Genesee St., Buffalo, N. Y.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill. "Jumbo."

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

"GO" Motor-Speeder Co., 165 Third Ave., Three Rivers, Mich. (See page 847.)

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J. (See page 457.)

HUB Auto Specialties Co., 100 Arlington Ave., Charlestown, Mass.

HUNT—See Burnox Co.

JEWELL Auto Devices Co., Frankfort, Ind.

JOHNSON S-P-C—See Symons Bros. Co.

JUMBO—See Edelmann & Co.

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

PAR Kop Mfg. Co., 1522 Ingersoll St., Philadelphia, Pa. "Parker."

PARKER—See Par Kop Mfg. Co.

PEERLESS Motor Specialty Co., 140 W. 52d St., New York, N. Y.

PERKINS Appliance Co., 539 Worthington St., Springfield, Mass. (See page 709.)

ROPER & Co., C. F., Hopedale, Mass.

SYMONS Bros. Co., Winnetka, Ill. "Johnson S-P-C." (See page 645.)

THOMAS Carbon Remover Co., 46 Broadway, Providence, R. I. (See page 179.)

UNIVERSAL Device Co., Three Rivers, Mich. (See page 797.)

VETTER, W. G., 318 Flyn St., Alva, Okla.

WHITTELSEY Co., 17 Battery Pl., New York, N. Y.

MOULDINGS

WOOD DOOR MOULDINGS

(See Strips, Wood Door)

MUFFLERS

EXHAUST MUFFLERS

EVER CLEAN—See Miller & Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GRAY-HAWLEY Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 617.)

MAXIM Silencer Co., 115 Homestead Ave., Hartford, Conn. (See page 623.)

MILLER & Co., Spring Valley, Ill. "Ever Clean."

RITESIZE—See Yankee Co.

YANKEE Co., 69 Genesee St., Utica, N. Y. "Ritesize."

OILERS

ENGINE OILERS

(See Lubricators, Special)

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The most efficient noise-reducer—the Maxim Silencer, recognized the world over—has been adapted to the exhaust of automobiles and is a surprising success. We are now supplying this

MAXIM AUTO SILENCER

to a considerable number of automobile manufacturers who find it a long step in advance of the old back pressure muffler with its wasteful baffle plates, tubes and holes. We would enjoy equipping your new models. Write us for detailed information.

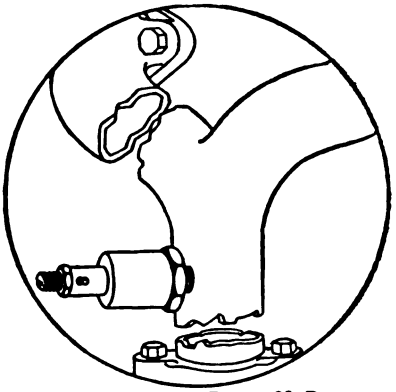
MAXIM SILENCER

Especially for Ford Cars

Can't burst—no vibration—swallows every explosion—adds speed—large roomy passages. Thousands proving it daily. Buy one—enjoy your car more. Write for explanatory booklet.

THE MAXIM SILENCER CO.
115 Hom estead Ave., Hartford, Conn.

Perrin "More Power" Valve



Pays For Itself Every 30 Days

The Perrin More Power Valve is sold only through Dealers and Garages. You can obtain them from your Jobber.

Made entirely of brass and phosphor bronze. No leather discs or valve seats to wear out. Operates entirely automatically.

More power on less gasoline. Makes a smoother running engine—better pick-up—better hill climbing—less carbon—less engine trouble. Simply bore and tap the intake manifold—screw in the Valve—it's ready for business. Stock this new accessory now—it's ready sale will surprise you.

Made exclusively by the

Perrin Mfg. Company, Detroit, Michigan
Eastern Agts., Asch & Co., 1779 Broadway, New York

Our new catalogue of Hoyt meters illustrates a line of exceptional interest to Ford dealers and accessory houses because of the opportunity it offers for profitable merchandising. A copy will be sent you free on request.

Hoyt Elec. Inst. Works, Penacook, N.H.

No. 1A

No. 4A

"UNION" AUTO FUSE MATERIAL

Fuses for Every Known Make of Car—Write for Samples

Special Parts and Stampings

Let us quote prices

SEND BLUE PRINTS OR SAMPLES

CHICAGO FUSE MFG. CO.
CHICAGO NEW YORK

Fuse Box

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OILERS (Continued)

SPRING LEAF OILERS

(See Cups, Spring Leaf Lubricating)

OPENERS

CURTAIN OPENERS

BLACKMORE—See Dayton Top Improvement Co.

DAYTON Top Improvement Co., Dayton, O. "Blackmore." (See page 357.)

PET COCK OPENERS

(See Wrenches, Oil Cock)

PADS

PEDAL PADS

AUTO Pedal Pad Co., 794 Seventh Ave., New York, N. Y.

E. G.—See Grossman Mfg. Co.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

MATTSON Rubber Co., Lodi, N. J. (See page 827.)

R. & C. Auto Accessories Co., 90 John St., New York, N. Y.

RIVES Mfg. Co., Geo. H., Woolworth Bldg., New York, N. Y.

PAINTS

PAINTS AND VARNISHES

ARSENAL Varnish Co., 35th St. & Fourth Ave., Rock Island, Ill.

DURKEE-ATWOOD Co., Minneapolis, Minn. "Rie-Nie." (See pages 189 to 192.)

FOREST City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

HANLINE Bros., Baltimore, Md.

NORTHWESTERN Chemical Co., Marietta, O. "Norwesco." (See pages 172 and 173.)

NORWESCO—See Northwestern Chemical Co.

RIE-NIE—See Durkee-Atwood Co.

TROPICAL Paint & Oil Co., Cleveland, O.

VAN Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

WADSWORTH-HOWLAND Co., 225 N. Carpenter St., Chicago, Ill.

WANG—See Van Tilburg Oil Co.

WONDER WORKER—See Hall-Thompson Co.

PARTS

REPAIR PARTS FOR FORD CARS

(This is a list of Dealers in Repair Parts for Ford Cars who advertise in this Publication)

AUTO Parts Co., Providence, R. I. (See page 607.)

GROSSMAN Auto Parts Co., 38 De Kalb Ave., White Plains, N. Y.

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

SIMMONS Metal Goods Co., 1017 Woodland Ave., Cleveland, O. (See page 583.)

PEDALS

ACCELERATOR PEDALS

(See Accelerators, Foot)

PINS

PISTON PINS

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

VALVE STEM PINS

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PISTONS

SPECIAL LIGHT WEIGHT PISTONS

AALDING Mfg. Co., Manchester, N. H. (See page 739.)

BUTLER Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind. (See page 747.)

DOANE Machine Co., Franklin, N. H.

DEPUY Bros., Canterbury, N. H.

FEATHERWEIGHT Piston Co., 11 Guyman Way, Pittsburgh, Pa.

LEVETT Co., W. M., 417 E. 23d St., New York, N. Y.

LONGAKER Co., V. A., Indianapolis, Ind.

LYNITE—See McQuay-Norris Mfg. Co.

M & P Co., Saranac Lake, N. Y.

McQUAY-NORRIS Mfg. Co., 2832 Locust St., St. Louis, Mo. "Lynite." (See page 433.)

NOONAN, D. R., W. Washington St., Paris, Ill.

TURKO—See Turnbull Mfg. Co.

TURNBULL Mfg. Co., Wilmington, O. "Turko."

WHITMAN Luvium Metal Mfg. Co., 6900 S. Broadway, St. Louis, Mo.

Complete Index to Classification appears on Pages 28 to 32.

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H-S Repair parts for the ~ Ford Cars. 400 of them

H-S

Is the trade mark which satisfies the REPAIR MAN.

We are not afraid to have you ask him what is the standard of quality in REPAIR PARTS—for his answer will be H-S

Therefore, let it be known that you handle the entire H-S Line *as a line*, not merely H-S Radius Rods or H-S Differential Cases.

We are adding new parts constantly.

Send for booklet and No. 9 price list.

"We have H-S Parts for Overland Also."

Hill-Smith Metal Goods Co.

88 Pearl St., Boston, Mass.

H-S H-S

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PLATES

VALVE COVER PLATES

(See Covers, Valve)

PLUGS

SPECIAL AND PRIMING SPARK PLUGS

AC-CICO—See Champion Ignition Co.

B. A. T. Co., Germantown and Stenton Aves., Philadelphia, Pa. "Panther."

BENFORD Mfg. Co., Box H., Mt. Vernon, N. Y. "Monarch." (See page 695.)

BENTON Co., L. F., Vergennes, Vt.

BETHLEHEM—See Silvex Co.

CHAMPION Ignition Co., Flint, Mich. "Ac-Cico." (See page 795.)

CHAMPION Spark Plug Co., 1014 Upton Ave., Toledo, O. (See pages 385 to 388.)

FAIRMANCO—See Fairmont Mfg. Co.

FAIRMONT Mfg. Co., (Brighton Station), Cincinnati, O. "Fairmanco."

GIBSON-HOLLISTER Mfg. Co., 3380 Washington St., Boston, Mass. "Jumbo." (See pages 391 and 392.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. (See page 829.)

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. "Master." (See page 383.)

HERZ & Co., 245 W. 55th St., New York, N. Y. "Pro-Mo-Tor." (See page 389.)

JUMBO—See Gibson-Hollister Mfg. Co.

MACGREGOR Co., John, Roslindale, Mass. "Viking."

MASTER—See Hartford Machine Screw Co.

MONARCH—See Benford Mfg. Co.

MOSLER & Co., A. R., Mt. Vernon, N. Y. "Ram Rod."

PANTHER—See B. A. T. Co.

PRO-MO-TOR—See Herz & Co.

RAJAH Auto-Supply Co., Bloomfield, N. J. (See page 393.)

RAM ROD—See Mosler & Co.

REFLEX Ignition Co., 1710 Payne Ave., Cleveland, O. (See page 675.)

REX Ignition Mfg. Co., Broadway & 58th St., New York, N. Y. (See page 395.)

SHARP Spark Plug Co., 3343 Broadview Rd., Cleveland, O.

SILVEX Co., 171 Madison Ave., New York, N. Y. "Bethlehem."

V-RAY Co., Marshalltown, Ia. (See page 393.)

VIKING—See MacGregor Co.

POCKETS

DOOR POCKETS

ATLAS Specialty Mfg. Co., 217-21 N. Michigan Ave., Chicago, Ill. (See page 793.)

CHICAGO Hassock Co., 1731 S. State St., Chicago, Ill.

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

PRIMERS

ENGINE PRIMERS

(See Also Heaters, Mixture; Also Mixers, Fuel)

GEM Primer Co., Springfield, O.

GOULD Mfg. Co., Cincinnati, O. (See page 627.)

HOME Light Co., 3353 Milwaukee Ave., Chicago, Ill.

KING, W. C., 911 Sargent St., Litchfield, Ill.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PERFECTION Auto Starter Co., 204 16th St., Denver, Colo.

WELD Mfg. Co., North Chatham, Mass.

ZIMMERMAN'S GARAGE, Valparaiso, Ind.

PULLERS

AXLE HOUSING PULLERS

HANDEE—See Racine Handy Mfg. Co.

RACINE Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee." (See page 621.)

UNIVERSAL Mfg. Co., Racine, Wis.

WHEEL PULLERS

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

B. L. B. Mfg. Co., 864 Woodward Ave., Detroit, Mich.

BENFORD Mfg. Co., Box H., Mt. Vernon, N. Y. (See page 695.)

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O.

CENTRAL Foundry Co., Marshalltown, Ia.

DACO—See Danver Accessory Co.

DANVER Accessory Co., Pawtucket, R. I. "Daco."

E. G.—See Grossman Mfg. Co.

EASY-OFF—See Honn, Peter.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

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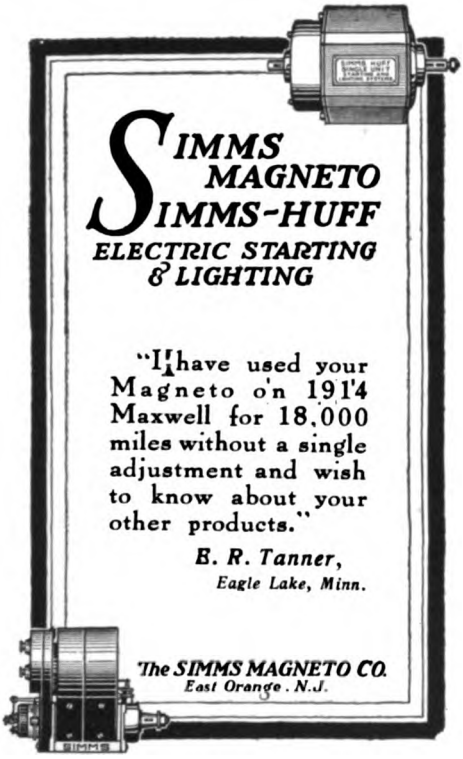


"4 DROPS and a QUICK PULL will start your Ford in the Winter"

Tell them that and a sale follows.

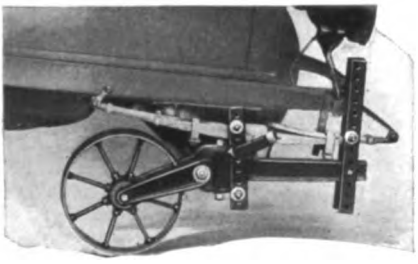
The Universal Primer makes a priming plug of any plug in two minutes.

EFFICIENCY GUARANTEED

Price 50 cents

A good seller with a liberal proposition for dealers

GOULD MFG. CO.
CINCINNATI, O.



You can bring them in without trouble by using

The Guss Company's Emergency Wheel

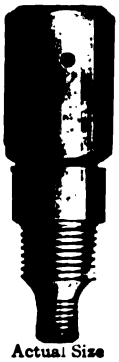
The Garageman's Best Friend

Quickly Attached to any Car Under All Conditions

Made of Steel with Roller Bearings

STRONG EFFICIENT CHEAP

O. G. Guss Company
Delphos Ohio



Actual Size

Don't Burn Gasoline BURN AIR

An auxiliary air valve in your intake manifold, operated automatically by the suction of your motor.

THE AEROFRAM

A Gasoline Saver THAT SAVES

Costs but one dollar, can be attached to any car in 10 minutes. Gives more power, keeps down carbon, and makes the motor run more smoothly. Nothing to adjust—positively automatic.

On accurate tests made on more than 100 automobiles, an average increased mileage of 5.7 miles per gallon was shown. Ask your dealer or

Send $1.00 and an AEROFRAM will be sent you by return mail

The Aerofram Company, Inc.
107 Massachusetts Ave., Boston, Mass.
A Guarantee in Every Box. *Agents Wanted*

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PULLERS (Continued)

WHEEL PULLERS (Continued)

GREER, Fredric, 525 W. Van Buren St., Chicago, Ill.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HONN, Peter, 578 Stocking Ave., Grand Rapids, Mich. "Easy-Off."

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

PUMPS

CIRCULATING PUMPS

(See Pumps, Water)

ENGINE DRIVEN TIRE PUMPS

ADVANCE Machinery Co., Toledo, O.
(See page 609.)

BENN Pump Works, 3 Tremont Row, Boston, Mass.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y. "San Ford."

COLSTAD Sales Co., 48 Binford St., Boston, Mass.

HERT Mfg. Co., 150 S. Delaware St., Indianapolis, Ind. "Purair."

HILL Pump Valve Co., Archer Ave., Canal & 23d Sts., Chicago, Ill. "Utility Junior."

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. "Juleco."
(See pages 415 and 799.)

JULECO—See Judd & Leland Mfg. Co.

KELLOGG Mfg. Co., Rochester, N. Y.
(See page 413.)

MANZEL Bros. Co., 320 Babcock St., Buffalo, N. Y.

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O.
(See page 775.)

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill.
(See page 735.)

MOTOR Air Pumping Sales Corp., Roanoke, Va.

NATIONAL Motor Supply Co., 5607 Euclid Ave., Cleveland, O.

PITTSBURGH Auto Equipment Co., Pittsburgh, Pa. "Union."

PURAIR—See Hert Mfg. Co.

SAN FORD—See Brown Co.

STEWART-WARNER Speedometer Corp., Chicago, Ill.
(See page 461.)

UNION—See Pittsburgh Auto Equipment Co.

UNIVERSAL Air Equipment Co., 49 S. Delaware St., Indianapolis, Ind.

UTILITY JUNIOR—See Hill Pump Valve Co.

OIL PUMPS

(See Lubricators, Special)

TIRE PUMPS

(See Pumps, Engine Driven Tire)

WATER PUMPS

CRUM-WILEY Mfg. Co., Peru, Ind.

MOTOR Cooling System Co., Munsey Bldg., Baltimore, Md.

SECURITY Co., 56 Terminal Way, Pittsburgh, Pa.

SCHILLING Mfg. Co., 928-30 Pacific Ave., Long Beach, Cal. "Vanreush."

VANREUSH—See Schilling Mfg. Co.

QUADRANTS

SPARK AND THROTTLE QUADRANTS

N. Y. Motor Car Device Co., 299 11th Ave., New York, N. Y. "Premo."

PIERCE Speed Governor Co., Anderson, Ind.

PREMO—See N. Y. Motor Car Device Co

RACKS

TRUNK RACKS

MASCO—See Milwaukee Auto Specialty Co.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MILWAUKEE Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

RICHARDS-WILCOX Mfg. Co., Aurora, Ill.

W-B—See Weiss-Bosley Sales Co.

WEISS-BOSLEY Sales Co., 1411 Chestnut St., St. Louis, Mo. "W-B."

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
(See page 817.)

RADIATORS

AUTO Radiator Mfg. Co., 764-66 W. Van Buren St., Chicago, Ill.
(See page 791.)

AUTOMOBILE Specialty Co., 999 Woodward Ave., Detroit, Mich.

CANDLER Radiator Co., Detroit, Mich.
(See page 423.)

CHICAGO Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill.

DETROIT Radiator & Specialty Co., 963 Woodward Ave., Detroit, Mich.

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NATIONAL RADIATORS

"The Sign of Quality and Perfection in Radiators"

NATIONAL ZIG ZAG RADIATOR and STREAMLINE HOOD

Including Dash Ledge and Starting Crank **$45.00** For Old or New Ford Cars

We are the Pioneers and Originators of this latest style-plus for Ford Cars—and the LEADERS.

DEALERS! Here is your opportunity to supply the demand for the biggest seller for the biggest market in the biggest end of the Automobile Industry.

National Can Company
Radiator Department
Detroit, Mich., U. S. A.

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RADIATORS (Continued)

EL Arco Radiator Co., West End Ave. & 64th St., New York, N. Y.

EUREKA Auto Parts Mfg. Co., 1915-17 Pine St., St. Louis, Mo.

FEDDERS Mfg. Co., Buffalo, N. Y.
(See page 425.)

G & O Mfg. Co., New Haven, Conn.
(See page 789.)

IDEAL Sheet Metal Works, 28th St. & Michigan Ave., Chicago, Ill.
(See page 633.)

LAWCO—See Lawson Co.

LAWSON Co., F. H., Dept. D., Cincinnati, O. "Lawco."
(See page 617.)

LIVINGSTON Radiator & Mfg. Co., 311 W. 75th St., New York, N. Y.
(See page 631.)

NATIONAL Can Co., Detroit, Mich.
(See page 629.)

ROME-TURNEY Radiator Co., Rome, N. Y.
(See page 423.)

SUPERIOR Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

WRIGHT Cooler & Hood Mfg. Co., 1253-55 S. Michigan Ave., Chicago, Ill.
(See page 265.)

RAILS

FOOT RAILS

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
(See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

ROBE RAILS

APCO—See Auto Parts Co.

ATTWOOD Brass Works, Grand Rapids, Mich.
(See page 443.)

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

WAKEFIELD Sales Co., Trempeleau, Wis.

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
(See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

RECHARGERS

MAGNET RECHARGERS

(See Chargers, Magneto Magnet)

REFLECTORS

HEADLIGHT REFLECTORS

C-S—See Culver-Stearns Mfg. Co.

COLUMBUS Auto Brass Co., 767 N. Fourth St., Columbus, O.

CULVER-STEARNS Mfg. Co., Detroit, Mich. "C-S."
(See page 699.)

E. G.—See Grossman Mfg. Co.

EXCELITE—See Newfield Silver Mfg. Co.

FITZGERALD Mfg. Co., Railroad Ave., Torrington, Conn.
(See page 685.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HIPWELL Mfg. Co., 831-35 North Ave., W., Pittsburg, Pa.

NEWFIELD Silver Mfg. Co., State & Ash Sts., Bridgeport, Conn. Excelite."

ROSCO—See Rosen & Co.

ROSEN & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
(See page 183.)

VESTA Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

REGULATORS

ELECTRIC LIGHT REGULATORS

ABCO—See American Battery Co.

AMERICAN Battery Co., 1132-34 Fulton St., Chicago, Ill. "Abco."

ASKE Automatic Voltage Regulator Co., Providence Bldg., Duluth, Minn.

BANES & Muench, 70th Ave. & York Rd. (Oak Lane), Philadelphia, Pa.

BENJAMIN Electric Mfg. Co., 120 S. Sangamon St., Chicago, Ill. "Regulite."

DIMIT—See Suburban Lighting & Gas Engine Co.

E. G.—See Grossman Mfg. Co.

EQUI Light Co., 121 N. Fourth St., Paducah, Ky.

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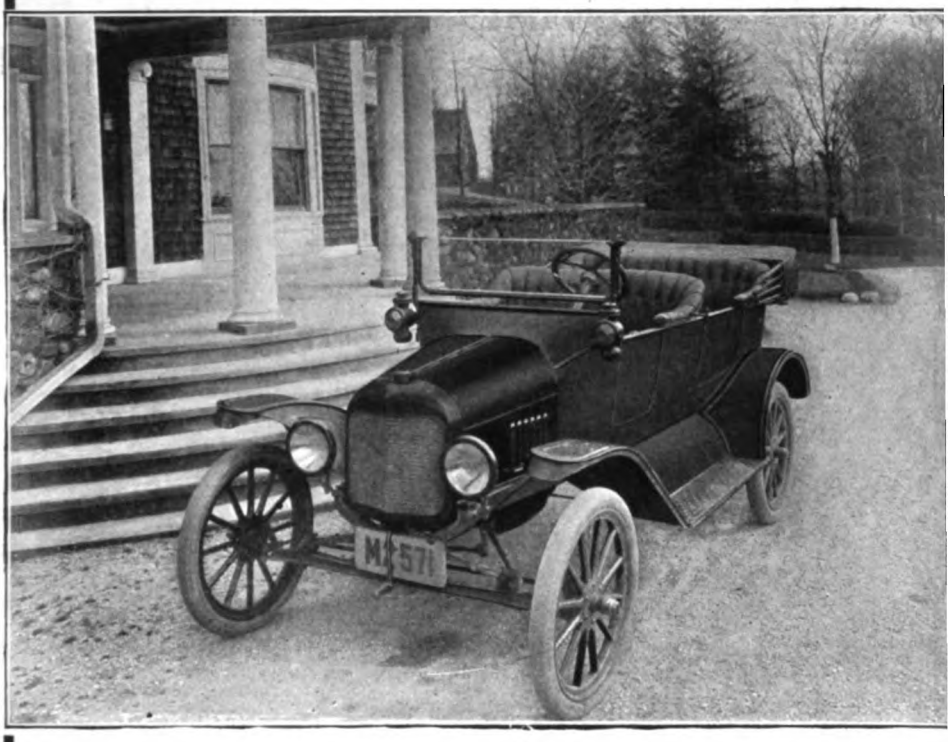

An Atmosphere of Beauty for the Ford

What a change! Gone are the corners, angles and flat surfaces that are so readily recognized. In their places are sweeping curves, rounded corners and real streamlines. Every one a point of beauty. And just as great an improvement in service is here, too—the one-piece pressed-steel shell, within which the complete brass radiator is securely riveted, absorbs all shock, the radiator itself is free from injury. And the Livingston radiating section cools—perfectly. Every Ford owner can improve the appearance and service he gets from his car—

Combination "Bulldog" Radiator and Streamline Hood for 1915 and 1916 Ford Cars, $45.00, Black Enamel Finish. Weight, 35 lbs. Water Capacity, 3½ Gals. Shipping Weight, 98 lbs.

AND THIS IS THE COMBINATION THAT DOES IT

45.00 NEW YORK F.O.B.

Nickel-Plated Finish, $5.00 Extra

Straight and Pointed Livingston Radiators are furnished for any model Ford car, to be used with the hoods supplied by the Ford Company.

DEALERS FIND THE HANDLING OF LIVINGSTON RADIATORS AND HOODS A MOST ATTRACTIVE PROPOSITION. DISCOUNTS SENT IMMEDIATELY TO THOSE ENTITLED.

Livingston Radiator & Mfg. Co.

311 West 75th St., NEW YORK, N. Y.

ALL TYPES OF RADIATORS BUILT AND REPAIRED

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REGULATORS (Continued)

ELECTRIC LIGHT REGULATORS (Continued)

EVENLITE—See St. Louis Electrical Works.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

J & B Mfg. Co., Pittsfield, Mass.
(See page 613.)

JEFFERSON Electric Mfg. Co., 847 W. Harrison St., Chicago, Ill.

NEW York Coil Co., 344 Pearl St., New York, N. Y.
(See page 635.)

REGULITE—See Benjamin Electric Mfg. Co.

ST. LOUIS Electrical Works, 5410 Easton Ave., St. Louis, Mo. "Evenlite."

SUBURBAN Lighting & Gas Engine Co., Summit & Lagrange Sts., Toledo, O. "Dimit."

VAN Sicklen Co., 14 Chicago St., Elgin, Ill.
(See page 459.)

HEADLIGHT REGULATORS

(See Regulators, Electric Light)

RELEASERS

CLUTCH RELEASERS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

HUMBOLDT Machine & Stamping Co., 31-85 Tenth St., Long Island City, N. Y.

IDEAL Brass Works, Tenth & Canal Sts., Indianapolis, Ind.

LEWI Clutch Control Co., 296 Lark St., Albany, N. Y.

McEWEN, R. A., Natoma, Kans.

METAL Stamping Co., 13th St. & Boulevard Long Island City, N. Y.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O.
(See page 207.)

ZIMMERMAN'S Garage, Valparaiso, Ind.

REMAGNETIZERS

MAGNET REMAGNETIZERS

(See Chargers, Magneto Magnet)

RESTS

BACK RESTS

WOOD Co., W. C., 40 N. Tenth St., Minneapolis, Minn.
(See page 471.)

FOOT RESTS

(See Rails, Foot)

RETAINERS

REAR AXLE GREASE RETAINERS

BIDDICK & Co., 2602 N. Broadway, Los Angeles, Cal.

RIMS

DEMOUNTABLE RIMS

AUTOMOBILE Specialty Co., 999 Woodward Ave., Detroit, Mich.

BAKER—See Universal Rim Co.

COPITHORN Rim & Tire Co., 262 Washington St., Boston, Mass.

HOWARD Demountable Rim Co., 1850 E. State St., Trenton, N. J.

UNIVERSAL Rim Co., 1502 Michigan Ave., Chicago, Ill. "Baker."
(See page 633.)

EMERGENCY RIMS

TWIN-RIM Co., 103 Mass. Ave., Boston, Mass.
(See page 633.)

RINGS

SPECIAL PISTON RINGS

AMERICAN Piston Ring Co., Dept. D., Newark, N. J.
(See page 429.)

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

BAKER Valve Co., 1847 E. 28th St., Minneapolis, Minn. "Vapor Tight."

BURD High Compression Ring Co., Rockford, Ill.

ECO Mfg. Co., 53 State St., Boston, Mass.
(See page 831.)

K-P—See Keys Piston Ring Co.

KEYS Piston Ring Co., 3054 Olive St., St. Louis, Mo. "K-P."
(See page 695.)

LAKE Sales Co., 1947 Broadway, New York, N. Y. (Distributors.)
(See page 867.)

LEAK-PROOF—See McQuay-Norris Mfg. Co.

McQUAY-NORRIS Mfg. Co., 2832 Locust St., St. Louis, Mo. "Leak-Proof."
(See page 433.)

MICRO Piston Ring Co., 1960 Broadway, New York, N. Y.
(See page 823.)

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.
(See page 653.)

VAPOR TIGHT—See Baker Valve Co.

WASSON Piston Ring Co., Jersey Ave., New Brunswick, N. J.

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SPECIAL LAP ROBES

AUTOMOBILE Apparel Co., Portchester, N. Y. "Frunt-Seet."

FRUNT-SEET—See Automobile Apparel Co.

HOPEWELL Bros., Watertown, Mass. (See page 617.)

NATHAN Novelty Mfg. Co., A 84-90 Reade St., New York, N. Y. (See page 499.)

RODS

PUSH RODS

(For Valve Stem Adjusters—See Adjusters, Valve Stem)

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

RADIUS RODS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

CHIPPEWA Foundry & Machine Co., Chippewa Falls, Wis.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (See page 717.)

DONLIN Auto Co., C. A., Hopkins, Mo.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

H & M—See Radius Rod Co.

HALLS, A. S., Ortonville, Minn.

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

HONN, Peter, 578 Stocking Ave., Grand Rapids, Mich.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

J. H. S.—See Sager Co.

JOHNSON & Co., J. F., Quanah, Tex.

LENOLITE Mfg. Co., 6 N. Clark St., Chicago, Ill.

MONNICH-GAYLORD Co., Hooper, Neb.

OSTLIND Bros., Ortonville, Minn.

PAGE Woven Wire Fence Co., Adrian, Mich.

RADIUS Rod Co., Lamoni, Ia. "H & M."

RULISON Radius Rod Co., Saginaw, Mich.

SAFETY Mfg. Co., Illinois State Bank Bldg., Quincy, Ill.

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y. "J. H. S."

STANDARD Auto Accessory Co., Leipsic, O. (See page 837.)

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. (See page 653.)

VAUGHN-HARRIS Co., Vermilion, S. Dak.

W-B—See Weiss-Bosley Sales Co.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis.

WEISS-BOSLEY Sales Co., 1411 Chestnut St., St. Louis, Mo. "W.-B."

REAR AXLE TRUSS RODS

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

AUTO Parts Mfg. Co., 710 Bluff St., Sioux City, Ia.

DACO—See Danver Accessory Co.

DANVER Accessory Co., Pawtucket, R. I. "Daco."

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

H & M—See Radius Rod Co.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

METAL Stamping Co., 12th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

RADIUS Rod Co., Lamoni, Ia. "H & M."

RULISON Radius Rod Co., Saginaw, Mich.

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y.

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. (See page 653.)

SUNVOLD & Larson Mfg. Co., Sacred Heart, Minn.

W-B—See Weiss-Bosley Sales Co.

WEISS-BOSLEY Sales Co., 1411 Chestnut St., St. Louis, Mo. "W-B."

SEARCHLIGHTS

SWIVEL ELECTRIC SEARCHLIGHTS

(For attachment to Wind Shield)

CULVER-STEARNS Mfg. Co., Detroit, Mich. (See page 699.)

HAWTHORNE Mfg. Co., 39 Spruce St., Bridgeport, Conn. (See page 307.)

SEATS

SUPPLEMENTARY SEATS

McKINNON Dash Co., 252 Amherst St., Buffalo, N. Y.

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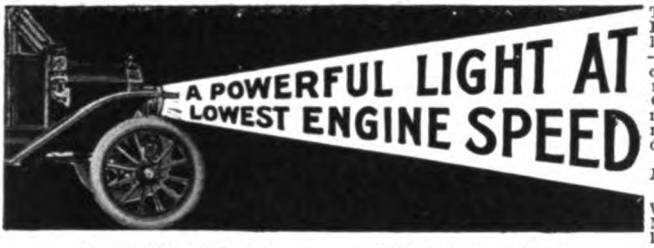

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SETS

WIRING SETS

BECCO—See Michigan Motor Specialties Co.

E. G.—See Grossman Mfg. Co.

FAW, J. H., 41 Warren St., New York, N. Y. "Fawsco"
(See page 845.)

FAWSCO—See Faw, J. H.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

WHITE, J. M., 210 N. 21st St., Philadelphia, Pa.

SHAFTS

REAR AXLE SHAFTS

COLLINS Co., E. B., 201 W. Main St., Danville, Ill. "Universal."

GIBBES Machinery Co., Columbus, S. C.

H & M—See Radius Rod Co.

RADIUS Rod Co., Lamoni, Ia. "H & M"

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

UNIVERSAL—See Collins Co.

VETTER, W. G., 318 Flyn St., Alva, Okla.

SHIELDS

WIND SHIELDS

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

CONOVER—See Page Woven Wire Fence Co.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O.
(See page 845.)

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

PAGE Woven Wire Fence Co., Adrian, Mich. "Conover."

RANDS Mfg. Co., Detroit, Mich.
(See page 637.)

VANGUARD Mfg. Co., Detroit, Mich.
(See page 455.)

SHOCK ABSORBERS

(See also Springs, Supplementary; Also Straps, Rebound)

CONNECTICUT Shock Absorber Co., Meriden, Conn.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

SIMPLEX Auto Specialty Co., 733 Woodward Ave., Detroit, Mich. "Yankee."

YANKEE—See Simplex Auto Specialty Co.

SHOES

BRAKE SHOES

APCO—See Auto Parts Mfg. Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

BUCKEYE—See Central Brass & Fixture Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye."

CENTRAL Foundry Co., Marshalltown, Ia.

CRUM-WILEY Mfg. Co., Peru, Ind.

DACO—See Danver Accessory Co.

DANVER Accessory Co., Pawtucket, R. I. "Daco."

E. G.—See Grossman Mfg. Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G."
(See page 829.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass.
(See page 625.)

HOWELL Co., W. H., Geneva, Ill.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
(See page 453.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

PANTHER—See B. A. T. Co.

PRESCOTT Auto Parts Co., Webster, Mass.
(See page 433.)

ROYAL Equipment Co., Bridgeport, Conn.
(See page 123.)

SPENCER'S Sons, I. S., Guilford, Conn.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 ElmSt., Newark, N. J.
(See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

SILENCERS

EXHAUST SILENCERS

(See Mufflers)

MUD GUARD SILENCERS

(See Braces, Mud Guard)

RADIUS ROD SILENCERS

(See Anti-Rattlers, Radius Rod)

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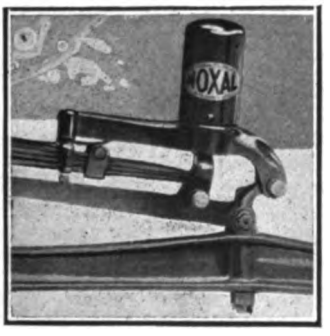

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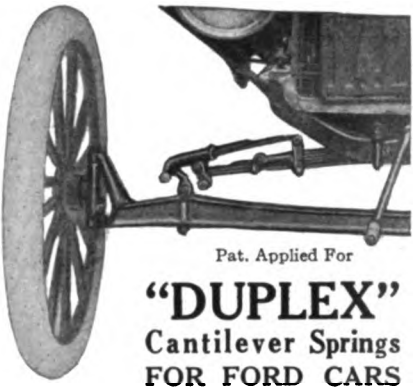
Sparton Sales Co., 504 Swetland Bldg., Cleveland, Ohio.
Beckley-Ralston Co., 18th Street & Michigan Ave., Chicago, Ill.
Electric Appliance Co., 807 Mission Street, San Francisco, Cal. Manufacturers:
BAKER-DUFFY CO., 29 South Clinton Street, Chicago, Ill.



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SILENCERS (Continued)

SPARK AND THROTTLE SILENCERS

(See Anti-Rattlers, Spark and Throttle)

SPINDLE ARM SILENCERS

(See Anti-Rattlers, Spindle Arm)

STEERING COLUMN SILENCERS

(See Braces, Steering Column)

STEERING ROD SILENCERS

(See Anti-Rattlers, Steering Rod)

SOCKETS

ANTI-RATTLING BALL SOCKETS

(See Anti-Rattlers, Steering Gear; also, Anti-Rattlers Radius Rod).

SPEEDOMETERS

SPEEDOMETERS AND ODOMETERS

GARFORD Mfg. Co., Elyria, O.
(See page 753.)

JONES Speedometer Co., Bush Terminal, Brooklyn, N. Y.

SEARS - CROSS Co., Bush Terminal, Brooklyn, N. Y.
(See page 465.)

STANDARD Thermometer Co., 65 Shirley St., Boston, Mass.
(See page 639.)

STEWART-WARNER Speedometer Corp., Chicago, Ill.
(See page 461.)

VAN Sicklen Co., 14 Chicago St., Elgin, Ill.
(See page 459.)

SPINDLES

EMERGENCY REAR AXLE SPINDLES

EKERN Bros., Flandreau, S. Dak.
(See page 783.)

LLOYD Bros., 300 S. Main St., Muncy, Pa.

SPRINGS

ENGINE VALVE SPRINGS

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass.
(See page 625.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

REAR COMPARTMENT LID SPRINGS

PERFECT—See Stewart Specialty Co.

STEWART Specialty Co., 79 E. Chestnut St., Columbus, O. "Perfect."
(See page 671.)

SPECIAL LEAF SPRINGS

GARDEN City Spring Works, 2300 Archer Ave., Chicago, Ill. "Ralco."

HIGGINS Spring & Axle Co., Racine, Wis.
(See page 847.)

MUIR Co., R. L., Broad & Race Sts., Philadelphia, Pa.

RALCO—See Garden City Spring Works.

TRIPLE Action Spring Co., 49 E. 28th St., Chicago, Ill.
(See page 855.)

SUPPLEMENTARY SPRINGS

(See also Shock Absorbers; Also Straps, Rebound)

ADCO—See Auto Device Mfg. Co.

ALEXANDER & Cox Co., Ogden & Western Aves., Chicago, Ill.

APCO—See Storrie Co.

AUTO Device Mfg. Co., Manufacturers Home Bldg., Milwaukee, Wis. "Adco."

AUTO Devices Co., 3214 Locust St., St. Louis, Mo. 'Baby Pamco."
(See page 715.)

BABY PAMCO—See Auto Devices Co.

BAKER-DUFFY Co., 20 S. Clinton St., Chicago, Ill. "Noxal."
(See page 637.)

BAYNE—See Safety Mfg. Co.

BEST—See Jackels & Campbell Co.

BLACKLEDGE Mfg. Co., John W., 341 E. Ohio St., Chicago, Ill. "Velvet."

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y. "None-Such."

BUCKEYE DE LUXE—See Central Brass & Fixture Co.

BURROWS-OVERTON Co., Little Neck, N. Y.

C-W—See Crum-Wiley Mfg. Co.

CENTRAL Brass & Fixture Co., N. Fountain Ave., Springfield, O. "Buckeye DeLuxe."

COLLINS Co., E. B., 201 W. Main St., Danville, Ill. "Universal."

COMFORT Shock Absorber Co., Hempstead, N. Y.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

CRUM-WILEY Mfg. Co., Peru, Ind. "C-W."

CUNARD Sales Co., 34 Portland St., Boston, Mass.

DIXIE Mfg. Co., 227 E. South St., Indianapolis, Ind.

DUPLEX—See Peerless Motor Specialty Co.

DUPLEX Cantilever Spring Co., 180 N. Dearborn St., Chicago, Ill.
(See page 637.)

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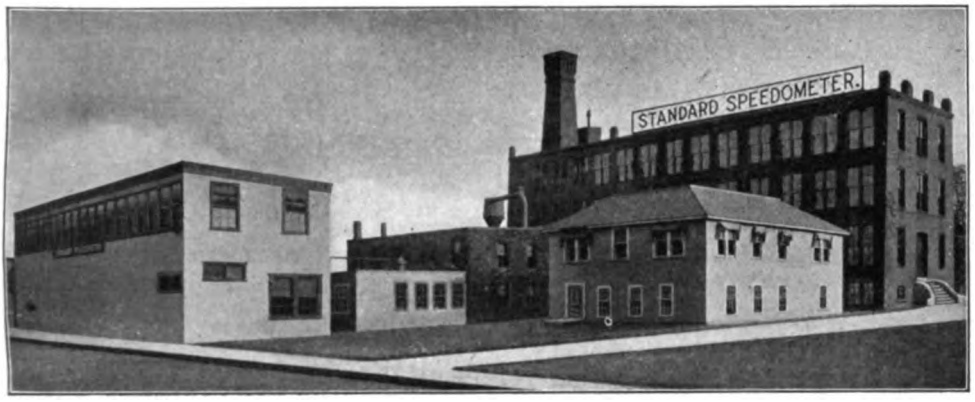

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SUPPLEMENTARY SPRINGS (Continued)

ECONOMY—See Gemco Mfg. Co.

FLEX-SPRING Co., 412 Orleans St., Chicago, Ill.

FLEXIBLE RIDER—See R. & R. Mfg. Co.

FLEXLEVER—See Halladay Co.

FORDEZER—See Walker Mfg. Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Economy."
(See page 127.)

GLOBE Engineering Co., South Bend, Ind.

GRAU Shock Absorber Co., 328 River St., Chicago, Ill.

H. & B.—See Home Light Co.

H. & D. Co., Goodland, Ind.

HALLADAY Co., L. P., Streator, Ill. "Flexlever."

HANDEE—See Racine Handy Mfg. Co.

HARPER Buggy Co., Columbia City, Ind.

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

HASSLER, Robt. H., Indianapolis, Ind.

HOME Light Co., 3353 Milwaukee Ave., Chicago, Ill. "H. & B."

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y. "Ridewell," "Little Giant."

INTER-STATE Mfg. Co., Danville, Ill.

J. M. Shock Absorber Co., 210 S. 17th St., Philadelphia, Pa.

JACKELS & Campbell Co., Kansas City, Mo. "Best."

JENNEY Mfg. Co., 535 N. Capitol Ave., Indianapolis, Ind.

JOHNSON—See Triple Action Spring Co.

JOHNSON Bronze Co., New Castle Pa. "Twin Koil."

K-W Ignition Co., 2900 Chester Ave., Cleveland, O.
(See pages 654 and 655.)

KEYSTONE Sales Co., 516 Federal St., Pittsburgh, Pa.

KEYSTONE Shock Absorber Co., Federal & Penn Aves., Pittsburgh, Pa.

KIM Mfg. Co., Merrimac, Mass.

LITTLE GIANT—See Humboldt Machine & Stamping Co.

LUXRY Shock Absorber Co., Cincinnati, O.

MESINGER Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

NEW Era Spring & Specialty Co., 850 Woodward Ave., Detroit, Mich.

NONE-SUCH—See Brown Co.

NOXAL—See Baker-Duffy Co.

PAR Kop Mfg. Co., 1522 Ingersoll St., Philadelphia, Pa.

PEERLESS Motor Specialty Co., 146 W. 52d St., New York, N. Y. "Duplex."

PIONEER Lamp Co., 57 E. 24th St., Chicago, Ill.

PRATT Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill.

R. & R. Mfg. Co., Elgin, Ill. "Flexible Rider."

RACINE-HANDY Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."
(See page 621.)

REX—See Volute Spring Shock Absorber Co.

RICHARDS-WILCOX Mfg Co., Aurora, Ill.

RIDEWELL—See Humboldt Machine & Stamping Co.

RIGHT Motor Specialties Co., 1322 Michigan Ave., Chicago, Ill.

ROADMAKER—See Turner Brass Works.

SAFETY Mfg. Co., Illinois State Bank Bldg., Quincy, Ill. "Bayne."

SAGER Co., J. H., 36-38 S. Water St., Rochester, N. Y.

STAR—See Union Elevator & Machine Co.

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. "W. X."
(See page 653.)

STONE—See Universal Rim Co.

STORRIE Co., William, 419 Eddy St., Providence, R. I. "Apco."

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal.

TASCO—See Troy Auto Specialty Co.

TEMCO Electric Motor Co., Leipsic, O.
(See pages 448 and 449.)

TRIPLE Action Spring Co., 49 E. 28th St., Chicago, Ill. "Johnson."
(See page 855.)

TROY Auto Specialty Co., 2 Federal St., Troy, N. Y. "Tasco."

TURNER Brass Works, Sycamore, Ill. "Roadmaker."

TWIN KOIL—See Johnson Bronze Co.

TWIN Spring Co., 998 Boylston St., Boston, Mass.

U. S.—See B. & L. Auto Lamp Co.

U. S. A.—See Utility Shock Absorber Co.

UNION Elevator & Machine Co., 227 W. Erie St., Chicago, Ill. "Star."

UNIQUE Specialty Co., S. 17th St., Flushing, N. Y.

UNIVERSAL—See Collins Co

UNIVERSAL Rim Co., 1502 Michigan Ave., Chicago, Ill. "Stone."
(See page 633.)

UTILITY Shock Absorber Co., 1426 Vine St., Philadelphia, Pa. "U. S. A."
(See page 761.)

VELVET—See Blackledge Mfg. Co.

VOLUTE Spring Shock Absorber Co., Mt. Vernon, N. Y. "Rex."

W-X—See Star Specialty Mfg. Co.

W. & C.—See Webber & Co.

WALKER Mfg. Co., 366 Wisconsin St., Racine, Wis. "Fordezer."

WEBBER & Co., Philip H., Hoopeston, Ill. "W. & C."
(See page 581.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J.
(See pages 591 to 596.)

VALVE SPRINGS

(See Springs, Engine Valve)

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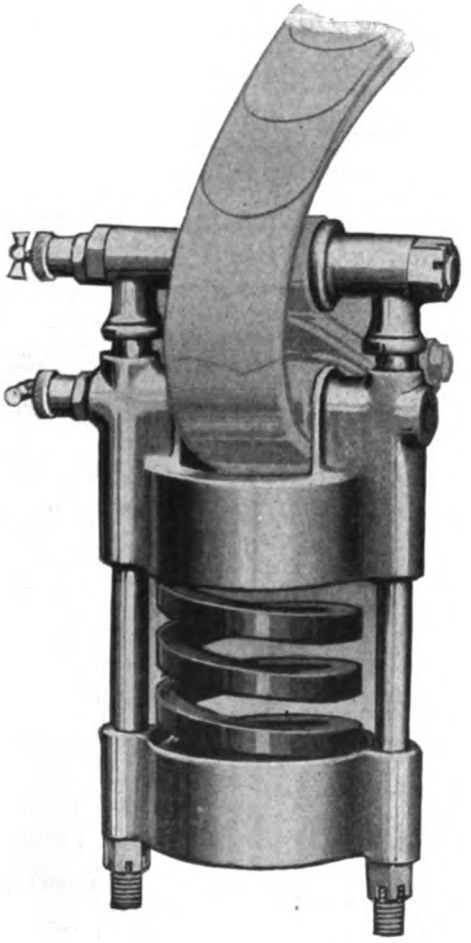
SHOCKING FACTS



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STANDS

MOTOR REPAIR STANDS

EKERN Bros., Flandreau, S. Dak.
(See page 783.)

LLOYD Bros., 300 S. Main St., Muncy, Pa.

SPENCER & Nelson, Lake View, Ia.

STARTERS

COMPRESSED AIR STARTERS

AIRGO—See Gray Motor Co.

GRAY Motor Co., Oakland & McLean Sts., Detroit, Mich. "Airgo."

KELLOGG Mfg. Co., Rochester, N. Y.
(See page 413.)

NORTHERN Engineering Works, 2 Chene St., Detroit, Mich. "Thurber."

STEWART-WARNER Speedometer Corp., Chicago, Ill.
(See page 461.)

THURBER—See Northern Engineering Works.

ELECTRIC STARTERS

A. B. C. Starter Co., 33 Woodbridge St., E., Detroit, Mich.

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

APELCO—See Apple Electric Co.

APPLE Electric Co., Newark, N. J. "Apelco."

DETROIT Starter Co., Detroit, Mich.
(See page 867.)

DISCO Electric Starter Corp., Detroit, Mich.
(See page 651.)

DUNNING—See Schwier Mfg. Co.

DYNETO Electric Co., Syracuse, N. Y.

EVEREADY—See American Ever Ready Works.

FISHER Electrical Works, 32 Lynn St., Detroit, Mich.

GENEMOTOR—See Picard & Co.

GRAY & DAVIS, Boston, Mass.
(See pages 483 to 486.)

HARTFORD, Edward V., 172 Morgan St., Jersey City, N. J.
(See page 457.)

HEINZE Co., John O., Springfield, O.
(See page 487.)

HENDRICKS Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind.
(See page 651.)

HUFF—See Simms Magneto Co.

JENNEY Electric Corp., Canal & Tenth Sts., Indianapolis, Ind.

KEMCO Electric Mfg. Co., 2229 Ashland Rd., Cleveland, O.

MORGAN Electric Co., 215 Moffat Blk., Detroit, Mich. "Rae."

NORTH East Electric Co., Rochester, N. Y.
(See page 487.)

PICARD & Co., A. J., 1720-22 Broadway, New York, N. Y. "Genemotor."

RAE—See Morgan Electric Co.

SCHWIER Mfg. Co., H. F., Boydell Bldg., Detroit, Mich. "Dunning."

SIMMS Magneto Co., East Orange, N. J. "Huff."
(See page 627.)

WELLS Mfg. Co., R. C., Fond du Lac, Wis.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

LEVER STARTERS

(See Starters, Manual)

MANUAL, PEDAL OR LEVER STARTERS

ACME—See Industrial Mfg. Co.

AMERICAN Dadco Co., Moffat Bldg., Detroit, Mich.

AUTO Parts Mfg. Co., 710 Bluff St., Sioux City, Ia. "Moore."

AUTO Starter Co., 168 N. Halsted St., Chicago, Ill. "Sandbo."

B.-B.—See Detroit Radiator & Specialty Co.

BALLARD, Henry, Patterson, N. Y.

BOSTON Starter & Specialty Co., 188 Columbus Ave., Boston, Mass.

BRINNON—See Peters & Herron Dash Co.

CENTURY—See Kear Specialty Co..

CHICAGO Ford Starter Co., 2430 Jackson Blvd., Chicago, Ill.

DENVER Ford Starter Co., 327 Century Bldg., Denver, Colo.
(See pages 647 and 651.)

DETROIT Radiator & Specialty Co., 963 Woodward Ave., Detroit, Mich. "B.-B."

DROFORD Starter Co., Moffat Bldg., Detroit, Mich.
(See page 651.)

EUREKA Parts Co., 328 Central Ave., Dunkirk, N. Y.

GAHM & McCormick Co., 802 E. Main St., Streator, Ill.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

GIANT Starter Co., Cleveland, O.
(See page 647.)

HANDEE—See Racine Handy Mfg. Co.

HUNTER Auto Supply Co., 4101 E. Ravenswood Ave., Chicago, Ill.

INDUSTRIAL Mfg. Co., 101-03 S. Fifth Ave., Chicago, Ill. "Acme," "O. K."

JIFFY Starter Co., 427 Grand River Ave., Detroit, Mich.

KEAR Specialty Co., 226 N. Sixth St., Reading, Pa. "Century."

KNAPP Bros., Starter & Equipment Co., 2337 Central Ave., Minneapolis, Minn.

MOORE—See Auto Parts Mfg. Co.

MURPHY Starter Co., Ida Grove, Ia.

O. K..—See Industrial Mfg Co.

PEORIA Specialty Co., Arcade Bldg., Peoria, Ill. Shur-Go."

PERFECTION—See Rich, D. S.

Complete Index to Classification appears on Pages 28 to 32.

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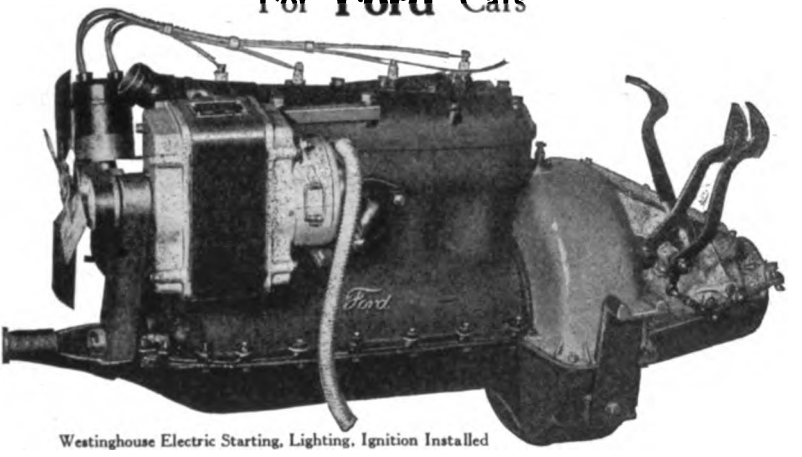
Westinghouse

Starting-Lighting-Ignition

For Ford Cars



Westinghouse Electric Starting, Lighting, Ignition Installed

"Completely Successful" describes the new Westinghouse Equipment for Ford Cars.—The Starting-Lighting Unit is mounted on adjustable brackets and is driven by a Westinghouse compensating sprocket through a silent chain three tons strong.

The price of this equipment complete, without lamps, is now $85.00, the increase being due to the enormous advance in the cost of raw materials.

DISTRIBUTORS

Atlanta, Ga	Alexander-Seewald Co.
Baltimore, Md	The Richardson Garage
Boston Mass	Motor Parts Co
Buffalo N. Y	Motor Parts Co.
Charleston, S. C	C. D. Franke & Co.
Chicago Ill	Westinghouse Sales Service Station
Chicago Ill	Motor Car Supply Co.
Cleveland Ohio	The Auto Elec. Equipment Co.
Cleveland Ohio	Westinghouse Sales Service Station
Denver, Col	Shaffer Auto Supply Co.
Halifax, Nova Scotia	Motor Sales Co., Ltd.
Houston, Texas	Tel Electric Co.
Indianapolis, Ind	Central Rubber & Supply Co.
Kansas City, Mo	The Equipment Co.
Little Rock, Ark	Rose-Lyon Hardware Co.
Louisville, Ky	Louisville Auto & Supply Co.
Minneapolis, Minn	Reinhard Brothers Co.
Nashville, Tenn	Hirsig Co., Inc.
New Orleans, La	Shuler Rubber & Supply Co.
New York, N. Y	Westinghouse Sales Service Station
Norfolk, Va	Reliance Electric Co.
Oklahoma City, Okla	Severin Tire & Supply Co.
Omaha, Neb	Powell Supply Co
Philadelphia, Pa	Motor Parts Co.
Pittsburgh, Pa	Pittsburgh Auto Equipment Co.
Pittsburgh Pa	Westinghouse Sales Service Station
Richmond, Va	Reliance Electric Co.
Springfield, Mass	Motor Parts Co.
St. Louis, Mo	Phoenix Automobile Supply Co.
Washington, D. C	Record Auto Supply & Service Co.
Wichita Falls, Texas	Western Auto Supply Co

Folder 4311-C gives full particulars.

Westinghouse Electric & Manufacturing Co.

Automobile Equipment Department

Shadyside Works Pittsburgh Pennsylvania

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STARTERS (Continued)

MANUAL, PEDAL OR LEVER STARTERS (Continued)

PERFECTION Auto Starter Co., 204 16th St., Denver, Colo.

PETERS & Herron Dash Co., Columbus, O. "Brinnon."
(See page 617.)

PRES-TOE—See Robertson Machine & Foundry Co.

RACINE-HANDY Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."
(See page 621.)

RICH, D. S., 21 Woodland Ave., Stamford, Conn. "Perfection."

ROBERTSON Machine & Foundry Co., 58 Rano St., Buffalo, N. Y. "Pres-Toe."

SANDBO—See Auto Stater Co.

SHUR-GO—See Peoria Specialty Co.

SIEVERKROPP Engine Co., 1227 18th St., Racine, Wis.

SIMPLEX Mfg. Co., Anderson, Ind.

SITSTIL—See Troy Auto Specialty Co.

STAR Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.
(See page 653.)

STRATFORD—See Symons Bros. Co.

SYMONS Bros. Co., Winnetka, Ill. "Stratford."
(See page 645.)

TOLEDO Auto Starter Co., 116 11th St., Toledo, O.
(See page 611.)

TROY Auto Specialty Co., 2 Federal St., Troy, N. Y. "Sitstill."

PEDAL STARTERS

(See Starters' Manual)

SPRING STARTERS

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."

EVEREADY—See American Ever Ready Works.

NEHER, L. M., Warsaw, Ind.

STRAPS

REBOUND STRAPS

(See also Shock Absorbers; also Springs, Supplementary)

G. & K.—See Graton & Knight Mfg. Co.

GEISEL, Otto E., 706 Chestnut St., Philadelphia, Pa.
(See page 501.)

GILMER Co., L. H. (Tacony), Philadelphia, Pa.
(See page 105.)

GRATON & Knight Mfg. Co., Worcester, Mass. "G. & K."
(See page 103.)

HOOVER Co., W. H., New Berlin, O.

MESINGER Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PALMER—See Rickley Auto Specialty Co.

PERKINS—CAMPBELL Co., 634 Broadway, Cincinnati, O.
(See page 207.)

RICKLEY Auto Specialty Co., Nasby Bldg., Toledo, O. "Palmer."

STRIPS

WOOD DOOR FINISHING STRIPS

GLOBE Seat Cover Co., Racine, Wis.

LONDON Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

SUPPLIES

DEALERS IN SUPPLIES

(This is a list of Dealers in Supplies for Ford Cars who advertise in this Publication)

AUTO Parts Co., Providence, R. I.
(See page 607.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass.
(See page 625.)

HOLMES Co., Fred E., Detroit, Mich.
(See page 607.)

SIMMONS Metal Goods Co., 1017 Woodland Ave., Cleveland, O.
(See page 583.)

SUPPORTS

BRAKE ROD SUPPORTS

AFFA—See Graffam & Co.

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

BENFORD Mfg. Co., Box H., Mt. Vernon, N. Y.
(See page 695.)

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CRUM-WILEY Mfg. Co., Peru, Ind.

DACO—See Danver Accessory Co.

DANVER Accessory Co., Pawtucket, R. I. "Daco."

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

GRAFFAM & Co., W. S., Northampton, Mass. "Affa."

HILL, H. E., Galesburg, Mich.

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
(See page 453.)

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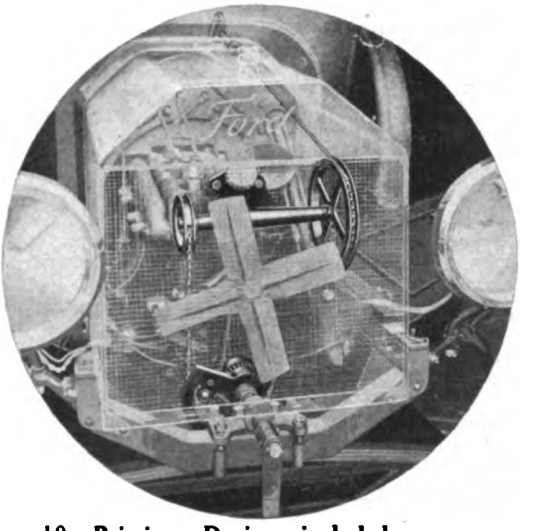
THE STARTFORD

Two vital questions are: Is it easily operated? Is it dependable and durable? The STARTFORD is made to satisfy the man who examines it critically and who tests it thoroughly with these questions in mind.

It is a carefully designed, honestly constructed, thoroughly dependable means of giving the motor quick compressions and live sparks, and for performing this more easily from the driver's seat than by using the crank.

The STARTFORD is characterized by the following special features, comprising the real reasons for its marked success:

1—**It's neat.** Only a trim and convenient handle shows.
2—**It's remarkably easy to operate.** Testing this will surprise you.
3—**It's durable.** The chilled Ratchet Lock and hardened Pawl of tool-steel show mechanical care.
4—**No rattle.** Spring tension prevents that.
5—**Firmly supported** on the head of the Motor.
6—**Not a bearing running to oil or catch dust.** This feature of design is important.
7—**Absolutely no danger from "back fire."** Automatic release takes care of that.
8—**It is entirely separate** from the crank—which may remain idly in place. Neither depends on any part of the other.
9—**Easy operation means quick compression, live spark, and sure result.**



10—**Priming Device included,** convenient to driver's left heel.

Price $14.00. Liberal discount to dealers.

JOHNSON S-P-C PLUG

(Saver-Primer-Cleaner)

A RATHER STRANGE FACT is that the suction in the manifold of a Ford car increases with the speed of the motor up to a certain point, but this suction decreases with higher speed of the motor. This holds true with respect to all motors equipped with the usual types of carbureter.

Therefore, any Gas Saver which provides for greater intake of air only as the suction increases, fails at high speed of the motor when air is most needed.

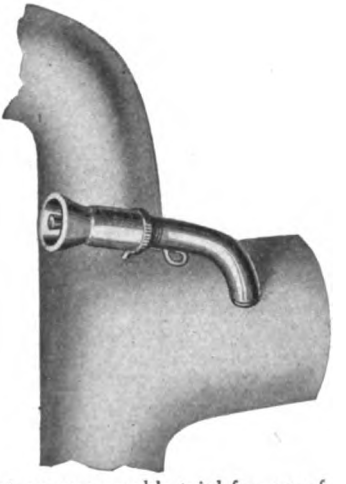
The Johnson S-P-C Plug is so designed that when the suction in the manifold decreases at high speed of the motor the inlet of air increases to supply the greater need.

For this reason the S-P-C Plug Gas Saver stands alone in excellence. It gives to the usual type of carbureter the merit of the highest priced carbureter.

As a fuel economizer it is worth more than $2.00.

As convenience for cleaning the motor—worth more than $2.00.

As convenient Priming Plug—worth more than $2.00.



It retails for $2.00; liberal dealers' discount. Sent on one week's trial for proof.

SYMONS BROTHERS COMPANY, Winnetka, Ill.

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SUPPORTS (Continued)

BRAKE ROD SUPPORTS (Continued)

METAL Stamping Co., 18th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NEW York Coil Co., 344 Pearl St., New York, N. Y. (See page 635.)

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

RADIATOR SUPPORTS

(See Cradles, Radiator)

SWITCHES

ELECTRIC LOCK SWITCHES

AUTOLOCK—See K-W Ignition Co.

B. L. B. Mfg. Co., 864 Woodward Ave., Detroit, Mich.

B-M—See Bass-Moody Co.

BASS-MOODY Co., 117 S. Washington St., Peoria, Ill. "B-M."

BURKHARDT Mfg. Co., G., 2123 N. Clark St., Chicago, Ill. "Perfection."

CLARK Lock Co., 57 Eddy St., Providence, R. I.

DEFENDER Auto Lock Co., Free Press Bldg., Detroit, Mich.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

K-W Ignition Co., 2900 Chester Ave., Cleveland, O. "Autolock." (See pages 654 and 655.)

PERFECTION—See Burkhardt Mfg. Co.

QUAYLE Mfg. Co., 20 W. Jackson Blvd., Chicago, Ill. (See page 306A.)

RAYLOX Mfg. Co., 1672 Fort St., W., Detroit, Mich.

STEWART Specialty Co., 79 E. Chestnut St., Columbus, O. (See page 671.)

TEMCO Electric Motor Co., Leipsic, O. (See pages 448 and 449.)

SYSTEMS

SINGLE SPARK IGNITION SYSTEMS

ATWATER Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa.

CONNECTICUT Telephone & Electric Co., Meriden, Conn. (See pages 508 and 509.)

NEW YORK Coil Co., 344 Pearl St., New York, N. Y. "Rhoades." (See page 635.)

PEERLESS Motor Specialty Co., 146 W. 52d St., New York, N. Y.

RHOADES—See New York Coil Co.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

TAPS

TAPS, DIES AND SCREW PLATES

GREENFIELD Tap & Die Corp., Greenfield, Mass. "Lightning." (See page 755.)

LIGHTNING—See Greenfield Tap & Die Corp.

WELLS & Son Co., F. E., 45 Ridell St., Greenfield, Mass.

TERMINALS

TIMER TERMINALS

PEDERSEN Lubricator Co., 636 First Ave., New York, N. Y. "United."

UNITED—See Pedersen Lubricator Co.

THERMOMETERS

RADIATOR THERMOMETERS

(See Meters, Heat Indicating)

TIMERS

IGNITION TIMERS

(See also Systems, Single Spark)

BENFORD Mfg. Co., Box H., Mt. Vernon, N. Y. "Monarch." (See page 695.)

BLITZ—See Electrical Specialties Mfg. Co.

BROWN Co., 213 Bellevue Ave., Syracuse, N. Y.

CONNECTICUT Telephone & Electric Co., Meriden, Conn. (See pages 508 and 509.)

CUNO Engineering Corp., 30 S. Vine St., Meriden, Conn.

DETROIT Engineering Products Co., Detroit, Mich. "Paramount." (See page 691.)

DOVEY, S. A., Coldwater, Mich.

ELECTRICAL Specialties Mfg. Co., 1125 N. 22d St., Omaha, Neb. "Blitz," "Intensifire."

INTENSIFIRE—See Electrical Specialties Mfg. Co.

J & B Mfg. Co., Pittsfield, Mass. (See page 613.)

MILWAUKEE Auto Engine & Supply Co., 29th St. & Mieneke Ave., Milwaukee, Wis.

MONARCH—See Benford Mfg. Co.

PARAMOUNT—See Detroit Engineering Products Co.

S. A. Machine Co., Detroit, Mich. (See page 749.)

TIRES

SPECIAL TIRES

REPUBLIC Rubber Co., Youngstown, O.

STANDARD Rubber Co., Howe Ave., Millbury, Mass.

STURGES Co., V. K., 26th & Union Sts., Oakland, Cal.

TOLEDO-FINDLAY Tire & Rubber Co., Western Ave., Findlay, O.

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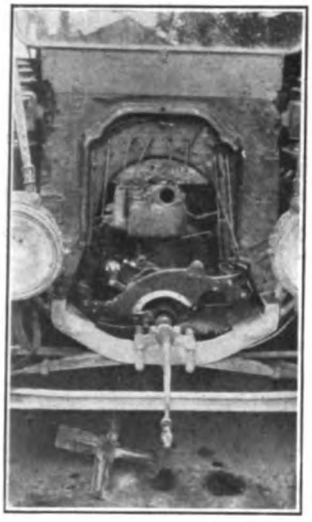
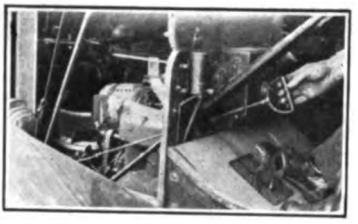


The Denver Starter For Ford Cars

Is Just the thing to put on your Ford and Metz autos.

Entirely concealed—guaranteed to turn your engine over—light, only weighs eight pounds—simple, any mechanic can put it on—positive in its action—Does not disfigure your car in any way—neither the crank or any other working part of your machine is interfered with—no ratchets—no cogs—no friction—automatically releases on back fire—no danger. This starter complete, delivered, charges prepaid anywhere in the United States for only $7.50.



THE DENVER FORD STARTER CO.
327 Century Building, Denver, Colo.

Gentlemen:

Please find inclosed $7.50 for which please send me one of your starters for Ford or Metz Cars, charges to be prepaid by you, with full instructions for putting same on.

Name .....
Street Number .....
City or Town.....State.....

Durable! Efficient! Economical!
Try It! You'll Like It!

The Denver Ford Starter Co.
327 Century Bldg. Denver, Colo.

The "GIANT" Starter

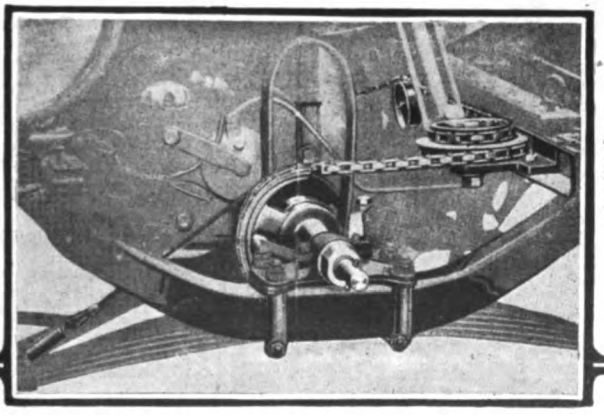
FOR FORDS

A simple, compact, mechanical starter, properly designed, properly constructed, and properly finished.
Simpler, cheaper and more efficient than any electric starter for Ford cars. Thoroughly guaranteed.

THE GIANT STARTER CO.
CLEVELAND OHIO
(Patents and Trade Mark allowed).

List price, $25.

Liberal discount to Agents



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TOOLS

CYLINDER REBORING TOOLS

DAVIS—See Hinckley Machine Works.

HEISER'S Special Tool Co., Kingston, Mo.

HINCKLEY Machine Works, Hinckley, Ill. "Davis."

PISTON RING COMPRESSING TOOLS

MORGAN Mfg. Co., John St., Newport, R. I.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

SPRING LEAF SEPARATING TOOLS

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

VALVE GRINDING TOOLS

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

CURKO—See Currier-Koeth Mfg. Co.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "Curko."

EUREKA Parts Co., 323 Central Ave., Dunkirk, N. Y.

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O. (See page 775.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PERFECT—See Smith Machine Works.

SMITH Machine Works, Winton L., Newark, N. J. "Perfect."

SPIRO Mfg. Co., 63-72 E. 131st St., New York, N. Y. "Uniq."

UNIQ—See Spiro Mfg. Co.

WALL, J. H., 290 Hope St., Bristol, R. I.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

VALVE LIFTING TOOLS

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUBURN Ignition Mfg. Co., Auburn, N. Y. (See page 451.)

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

CURKO—See Currier-Koeth Mfg. Co.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "Curko."

DONLIN Auto Co., C. A., Hopkins, Mo.

EBERHARD Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

EUREKA Parts Co., 323 Central Ave., Dunkirk, N. Y.

FLEXIBLE Valve Remover Co., 110 W. Exchange St., Providence, R. I.

FULTON Co., 708-10 National Ave., Milwaukee, Wis. (See page 695.)

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PERFECT—See Smith Machine Works.

SMITH Machine Works, Winton L., Newark, N. J. "Perfect."

WHITEHOUSE-LE COMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

VALVE RESEATING TOOLS

AMERICAN Valve Tool Co., 589 Hudson St., New York, N. Y.

BEAN Co., Berea, O.

CRONE, F. G., 334 Genesee St., Buffalo, N. Y.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

HUGHES, Bull Co., 1033 Hancock Ave., W., Detroit, Mich. "Use-Bull."

NOONAN, D. R., W. Washington St., Paris, Ill.

SPIRO Mfg. Co., 63-72 E. 131st St., New York, N. Y. "Uniq."

UNIQ—See Spiro Mfg. Co.

USE-BULL—See Hughes, Bull Co.

TOPS

SPECIAL AND ONE-MAN TOPS

A-W—See Adams-Williams Mfg. Corp.

ADAMS-WILLIAMS Mfg. Corp., 1790 Broadway, New York, N. Y. "A-W."

AMERICAN Top Co., Jackson, Mich.

ANCHOR Buggy Co., Cincinnati, O.

AUTO Specialty Factory, 1010 Spring St., Cincinnati, O.

AUTOMOBILE Specialty Co., 999 Woodward Ave., Detroit, Mich.

BALTIMORE Buggy Top Co., 107-13 W. Mt. Royal Ave., Baltimore, Md.

BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

CHICAGO Seat Cover Co., 2546 Wabash Ave., Chicago, Ill.

CLEVELAND Top Co., 3102 Franklin Ave., Cleveland, O.

COZY CAB—See Fouts & Hunter Carriage Mfg. Co.

CRAY Bros., 1111 W. 11th St., Cleveland, O.

DAISY—See Miller & Ashe.

DETROIT Slip Cover Co., 22 Hendrie Ave., Detroit, Mich.

DETROIT Weatherproof Body Co., Detroit, Mich.

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GREENSBURG TIRE & RUBBER CO.
GREENSBURG, PA.

INNER TUBES

HIGH GRADE BRANDS

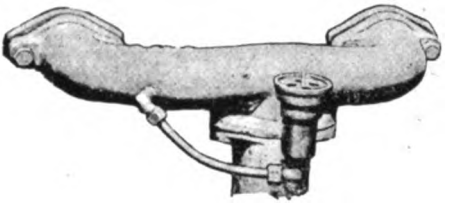
Red Wing Pyramid
Silver Grey Isbest

Universal Quadtube
A heavy Red Tube—will fit any Ford Tire.

Tubes
Made up on order a specialty

WRITE FOR PRICES

RUBBER TIRE ACCESSORIES COMPANY, Inc.
General Sales Agents
28 West 63d Street New York



DUPLEX VITALIZER

Is guaranteed—on an honest, money back proposition—to increase power, mileage and speed of any engine, to compel flexibility, to decrease carbon and make any car a better car.

Puts Life in Your Cash Drawer

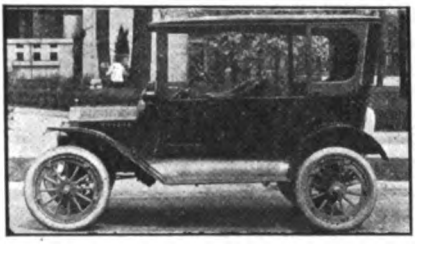
Vitalizer Sales are easily made. Everyone is satisfied. The instrument does *more* than we claim.
It attaches to the manifold, can be put on by any motorist in a few minutes.
Try one on your demonstrator.
Send for trade proposition.

Duplex Vitalizer Mfg. Corp.
Elmira, N. Y.

The Cozy Limousine Top for Ford Cars

"THE ALL-YEAR ROUND TOP"

Dealers: Here is the most practical Detachable Top ever constructed. Light in weight, handsome in appearance, low in price, high in quality. Thrown open or entirely closed in 30 seconds, without stopping car or driver leaving seat.



One and One-half Million Ford Owners as Prospective Buyers of Cozy DELUXE and LIMOUSINE detachable year-round tops. We have an unusually good proposition for dealers in our Special DELUXE TOP.

Correspondence with good established dealers solicited. Our production plans will permit of our taking care of the requirements of a limited number of additional dealers throughout the fall and winter seasons.

The Fouts and Hunter Carriage Manufacturing Co.
135 Third Street, Terre Haute, Indiana

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TOPS (Continued)

SPECIAL AND ONE-MAN TOPS (Continued)

FOUTS & Hunter Carriage Mfg. Co., 135 Third St., Terre Haute, Ind. "Cozy Cab." (See page 649.)

GORDON Co., J. P., 302 N. Forth St., Columbus, O. (See page 195.)

HEINZELMAN Bros. Carriage Co., Belleville, Ill. "Koupet."

HOLDEN One-Man Top Co., 1764 Broadway, New York, N. Y.

HORSTMAN Auto Top Co., 1923 Prospect Ave., Cleveland, O.

KOUPET—See Heinzelman Bros. Carriage Co.

McAVOY Co., M. I., 1220 Washington St., Racine, Wis. (See page 855.)

MILLER & Ashe, 114 N. Dexter St., Ionia, Mich. "Daisy."

OHIO Top Co., 909-11 Broadway, Cincinnati, O.

ONE-MAN Top & Supply Co., Dryden Bldg., Flint, Mich.

PARRY Mfg. Co., 110 Parry Ave., Indianapolis, Ind. (See page 589.)

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. (See page 207.)

SEAMAN Co., W. S., 486 Virginia St., Milwaukee, Wis.

SPLIT Hickory Wheel & Top Co., Sycamore St., Cincinnati, O.

UNICO—See Unit Construction Co.

WADSWORTH Mfg. Co., Detroit, Mich.

WARNER Auto Top Co., 1622-26 Central Ave., Cincinnati, O. (See page 211.)

WAYNE Auto Top Co., 313-15 Riopelle St., Detroit, Mich. (See page 531.)

WESTERN Auto Top Co., 1208-10 Jackson St., Omaha, Neb.

TRUSSES

REAR AXLE TRUSSES

(See Rods, Rear Axle Truss)

VALVES

AUXILIARY AIR VALVES

(See Mixers, Fuel)

ENGINE POPPET VALVES

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

FORD-CLARK Co., 3125 Perkins Ave., Cleveland, O. (See page 845.)

HILL-SMITH Metal Goods Co., 88 Pearl St., Boston, Mass. (See page 625.)

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill. (See page 453.)

MICHIGAN Engine Valve Co., 115-17 Columbia St., W., Detroit, Mich. (See page 549.)

MORGAN Mfg. Co., John St., Newport, R. I.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

SPENCER'S Sons, I. S., Guilford, Conn.

WHITEHOUSE-LeCOMPTE Mfg. Co., 42-54 Elm St., Newark, N. J. (See pages 591 to 596.)

GASOLINE RESERVE VALVES

(See Cocks, Fuel Supply and Reserve)

MUFFLER CUT-OUT VALVES

APCO—See Auto Parts Co.

ATLAS Machine Co., 110 W. Exchange St., Providence, R. I.

AUTO Parts Co., Providence, R. I. "Apco." (See page 607.)

BARCO Brass & Joint Co., 212-22 W. Illinois St., Chicago, Ill.

CENTRAL Foundry Co., Marshalltown, Ia.

CRUM-WILEY Mfg. Co., Peru, Ind.

E. G.—See Grossman Mfg. Co.

EMPIRE—See S. B. R. Specialty Co.

EWALD Novelty Works, Oakfield, Wis.

G. D.—See Piel Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GOULD Mfg. Co., Cincinnati, O. (See page 627.)

GRAY-HAWLEY Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

GROSSMAN Mfg. Co., Emil, Bush Terminal, Brooklyn, N. Y. "E. G." (See page 829.)

HEBERT Mfg. Co., Franklin, N. H.

HUMBOLDT Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

LINCOLN Machine Shops, Lincoln, Ill.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O. (See page 207.)

PIEL Co., G., 13th St. & Boulevard, Long Island City, N. Y. "G. D."

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Empire."

WESTERN Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill. (See page 817.)

WIENER-BARNET Co., 312-28 Adams St., Newark, N. J.

Complete Index to Classification appears on Pages 28 to 32.

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DISCO

Electric Starting and Lighting Systems

FOR FORD CARS

$75

Complete

Reliability — Simplicity — Power

Standard Equipment On 18 American Cars
Write for Free Booklet

Disco Electric Starter Corpn.

Detroit, U. S. A.

"Pioneer Builders in the Starter Field."

"DROFORD"

Starter for Ford Cars

Guaranteed

Money Refunded if not Satisfactory
Written Guarantee with Each Shipment

No Ratchets No Cogs Entirely Concealed

Price $12.50

Operates from the seat.
Instantaneous release in case of back-fire.
Prevents broken or sprained arms.
Your car is not taken apart or interfered with.
Present crank left on if desired.
No batteries, wires or short circuits.
Working parts case hardened.
No changes made in your motor.
Any mechanic can attach the "DROFORD."
Explicit instructions furnished.

State and County Representatives Wanted

Big Sellers Large Profits
Write for Terms, etc.

Droford Starter Company
311 Moffat Bldg., Detroit, Michigan

Kimbrough's Never Leak,

Is a liquid which when injected into your automobile or bicycle tire, will heal punctures automatically and instantaneously. This is not a filler. Guaranteed not to injure rubber, will add to the life of your tire—does not interfere with air cushion—occupies 5 per cent of the air space—does not gum or solidify—removes cause of 75 per cent. of blowouts.

Is not sticky—will not freeze—does not hinder vulcanizing—lasts indefinitely—costs but little—one gallon can is sufficient for ordinary car.

This is put in the inner tube—does not interfere with putting in air. This will save your money—save your time—save your temper and make your pleasure trips enjoyable.

Shipped anywhere in the United States charges prepaid, upon receipt of $5.00 per gallon can.

The Denver Ford Starter Company
Suite 327 Century Bldg. Denver, Colo.

Starting and Lighting Systems for Fords

$75.00

Lighting Outfits for Fords

$37.50

Write us to-day for Catalog

HENRICKS MAGNETO & ELECTRIC CO.

1200 St. Paul Street

INDIANAPOLIS, INDIANA

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VENTILATORS

DASHBOARD VENTILATORS

GAHM & McCormick Co., 802 E. Main St., Streator, Ill. "Keep Kool."

KEEP KOOL—See Gahm & McCormick Co.

UFASCO—See Unique Findings & Supply Co.

UNIQUE Findings & Supply Co., Providence, R. I. "Ufasco."
(See page 613.)

FRONT COMPARTMENT VENTILATORS

(See Ventilators, Dashboard)

WIND-SHIELD VENTILATORS

BANKER Windshield Co., Ellsworth & Negley Aves., Pittsburgh, Pa.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

GEMCO Mfg. Co, 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HALLADAY Co., L. P., Streator, Ill

ILLINOIS Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
(See page 453.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PERKINS-CAMPBELL Co., 634 Broadway, Cincinnati, O.
(See page 207.)

RANDS Mfg. Co., Detroit, Mich.
(See page 637.)

RICHARDS-WILCOX Mfg. Co., Aurora, Ill.

SECURITY Co., 56 Terminal Way, Pittsburgh, Pa.

VIBRATORS

MASTER VIBRATORS

(See also Coils, Spark)

AMERICAN Coil Co., Foxboro, Mass.

B-M—See Bass-Moody Co.

BASS-MOODY Co., 117 S. Washington St., Peoria, Ill. "B-M."

BRIGGS & Stratton Co., 258 Milwaukee St., Milwaukee, Wis.

BROWN Co., 212 Bellevue Ave., Syracuse, N. Y.

CONNECTICUT Telephone & Electric Co., Meriden, Conn.
(See pages 508 and 509.)

CROWE—See Lisle Mfg. Co.

HOOSIER Coil Co., 116-20 E. Jefferson Blvd., South Bend, Ind.

J & B Mfg. Co., Pittsfield, Mass.
(See page 613.)

K-W Ignition Co., 2900 Chester Ave., Cleveland, O.
(See pages 654 and 655.)

KINGSTON—See Kokomo Electric Co.

KOKOMO Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

LISLE Mfg. Co., Clarinda, Ia. "Crowe."

NEW Era Spring & Specialty Co., 850 Woodward Ave., Detroit, Mich.

NEW York Coil Co., 344 Pearl St., New York, N. Y.
(See page 635.)

PFANSTIEHL Co., North Chicago, Ill.
(See page 833.)

R. C. W.—See Wells Mfg. Co.

TEMCO Electric Motor Co., Leipsic, O.
(See pages 448 and 449.)

WELLS Mfg. Co., R. C., Fond du Lac, Wis. "R. C. W."

VULCANIZERS

PORTABLE VULCANIZERS

EXHAUST Heater Vulcanizer Co., Altoona, Pa.

G-WHIZ—See National Motor Supply Co.

HORSEY Mfg. Co., 6104 Euclid Ave., Cleveland, O.

HUMBOLDT Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

LAZARUS Mfg. Co., Belmont Bldg., Cleveland, O. "Lazco."

LAZCO—See Lazarus Mfg. Co.

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O.
(See page 775.)

NATIONAL Motor Supply Co, 5607 Euclid Ave., Cleveland, O. "G-Whiz."

SHALER Co., C. A., 902 Fourth St., Waupun, Wis.
(See pages 555 to 558.)

WASHERS

FELT WASHERS

(See Gaskets, Felt)

WHEELS

DEMOUNTABLE WHEELS

ANGIERS, Streator, Ill.

F. & H. Wire Wheel Co., Springfield, O.

MINUTE Auto Wheel Co., Georgetown, Pa.

SIMPLICITY Demountable Wheel Co., 425 Bond Ave., N. W., Grand Rapids, Mich.
(See page 613.)

STANDARD Auto Accessory Co., Leipsic, O.
(See page 837.)

FIFTH WHEELS

(For applying to the rear deck of the car so that trailer can be mounted)

MARTIN Rocking Fifth Wheel Co., 244 Main St., Springfield, Mass.

HEATED STEERING WHEELS

WARM Hand Steering Wheel Corp., Poughkeepsie, N. Y.
(See page 569.)

Complete Index to Classification appears on Pages 28 to 32.

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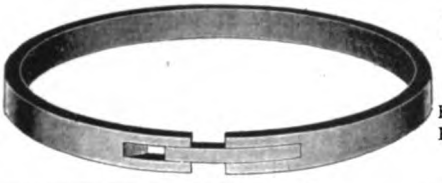
Automobile and Hardware Specialties
Accessories for Ford Cars

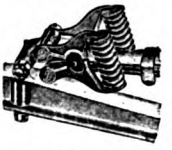


Piston Ring

Ford Size.
Price, each.
$0.80

W-X Best Shock Absorber

Cushions of Comfort.
Two for each Corner.
Price per set of four
$6.00



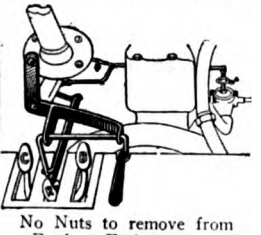
Star Ezy-Starter

Bronze bushed lever with oiler. Double Leverage Pulley with priming device.
Price, each..$15.00

Rear Axle Truss Rods

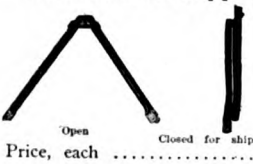
One piece rod.
Price, each $1.00
Two piece rod.
Price, each $1.25

Foot Accelerator

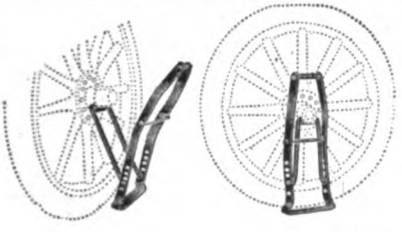


No Nuts to remove from Engine, Easy to attach..
Price, each $1.75

Radius Rod Supports



Price, each $1.50



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No. 0 (For Ford cars only). Price per set of four...$3.00
No. 1 (For Ford and light cars). Price per set of four 3.50
No. 2 (For all cars). Price per set of four..... 4.00
No. 3 (For all cars, extra heavy). Price per set of four 4.50

STAR SWITCH LOCK (Not Illustrated)
Price, each $4.00

RUNNING BOARD SUPPORT (Not Illustrated)
Price, each $1.20

FENDER SUPPORTS (Not Illustrated)
Price, each $1.00

GRINDERS

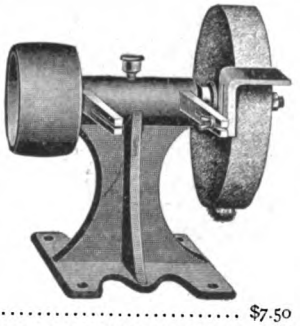
Hand Grinders

19	25		26	27
4 inch	5 inch	WHEELS	6 inch	7 inch
$2.25	$3.00		$4.00	$5.50

Dealers' Discounts 40%

37 styles and sizes of Grinders. We also manufacture the Star Vise.

Belt Drive Grinders



For Line Shaft or Gasoline Engines

No. 8.
Price $10.00
Dealers 6.50

No. 10.
Price $7.50
Dealers 4.00

STAR SPECIALTY MFG. COMPANY

227-233 WEST ERIE STREET, CHICAGO

SALES AGENTS· BENJAMIN S. ALDER CO., 30 Warren Street, New York
JACKELS & CAMPBELL CO., Kansas City, Mo.

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WHEELS (Continued)

PRESSED STEEL WHEELS

HYDRAULIC Pressed Steel Co., 3180 E. 61st St., Cleveland, O. "Parker-Hydraulic."
(See pages 229 and 230.)

PARKER - HYDRAULIC — See Hydraulic Pressed Steel Co.

SPECIAL STEERING WHEELS

AUTO Parts Mfg. Co., 544 Broadway, Milwaukee, Wis. "Badger."
(See page 865.)

BADGER—See Auto Parts Mfg. Co.

BECCO—See Michigan Motor Specialties Co.

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis.
(See page 127.)

HALLADAY Co., L. P., Streator, Ill.

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
(See page 671.)

NEVILLE Steering Wheel & Mfg. Co., 74 Congress St., W., Detroit, Mich.

WIRE WHEELS

GENERAL Rim Co., St. Marys, Pa.

GREAT Western Mfg. Co., Laporte, Ind. "Lindsay."

LINDSAY—See Great Western Mfg. Co.

MOTT Wheel Works, Utica, N. Y.
(See page 497.)

SPRANGER—See Universal Car Equipment Co.

STANDARD Welding Co., Cleveland, O.
(See Book Mark.)

UNIVERSAL Car Equipment Co., 62 E. Jefferson Ave., Detroit, Mich. "Spranger."

UNIVERSAL Welding Co., St. Anne, Ill.

ZARTH Wire Wheel Co., 99 S. Water St., Aurora, Ill.

WOOD WHEELS

BALTIMORE Hub Wheel & Mfg. Co., Gay St. & Fallaway, Baltimore, Md.

BUOB & Scheu, 500 E. Court St., Cincinnati, O.

PRESTO Inter-Rim Co., 940 Commonwealth Ave., Boston, Mass.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 804.)

SCHWARZ Wheel Co. (Frankford), Philadelphia, Pa.

WRENCHES

HUB CAP WRENCHES

B. L. B. Mfg. Co., 364 Woodward Ave., Detroit, Mich.

EDELMANN & Co., E., 341-49 E. Ohio St., Chicago, Ill.

METAL Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

MOSSBERG Co., Frank, Attleboro, Mass.
(See page 773.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

OIL COCK WRENCHES

MANZEL Co., Chas. W., 309 Beard Ave., Buffalo, N. Y.

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

NEW York Coil Co., 344 Pearl St., New York, N. Y.
(See page 635.)

SAFETY Mfg. Co., Illinois State Bank Bldg., Quincy, Ill.

W-B—See Weiss-Bosley Sales Co.

WEISS-BOSLEY Sales Co., 1403-05 Chestnut St., St. Louis, Mo. "W-B."

SPECIAL WRENCHES

ALLEN Wrench & Tool So., Public & Eddy Sts., Providence, R. I. "Eureka."

APCO—See Auto Parts Co.

AUTO Parts Co., Providence, R. I. "Apco."
(See page 607.)

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

BAY STATE AUTOKIT—See Cutter, Geo. A.

BILLINGS & Spencer Co., Hartford, Conn.

C. M. B. Wrench Co., Garwood, N. J.

CURKO—See Currier-Koeth Mfg. Co.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "Curko."

CUTTER, Geo. A, Taunton, Mass "Bay State Autokit."
(See page 765.)

EUREKA—See Allen Wrench & Tool Co.

HILL Pump Valve Co., Archer Ave., Canal & 23d Sts., Chicago, Ill. "Utility."

IMPROVED Gauge Mfg. Co., 356 W. Water St., Syracuse, N. Y.
(See page 241.)

LANE, Will B., 180 N. Dearborn St., Chicago, Ill. "Unique."
(See page 775.)

MOSSBERG Co., Frank, Attleboro, Mass.
(See page 773.)

NELSON Mfg. Co., A., 564-72 W. Randolph St., Chicago, Ill.

PANTHER—See B. A. T. Co.

UNIQUE—See Lane, Will B.

UTILITY—See Hill Pump Valve Co.

WALDEN Mfg. Co., Worcester, Mass.
(See pages 767 to 772.)

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

Complete Index to Classification appears on Pages 28 to 32.

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Machinery, Tools, Shop Equipment and Supplies

PART IV

Classified Lists of the Manufacturers of Machinery and Tools, and of Factory, Garage, Repair Shop and Foundry Equipment and Supplies

A complete index to classifications appears on pages 8 to 27

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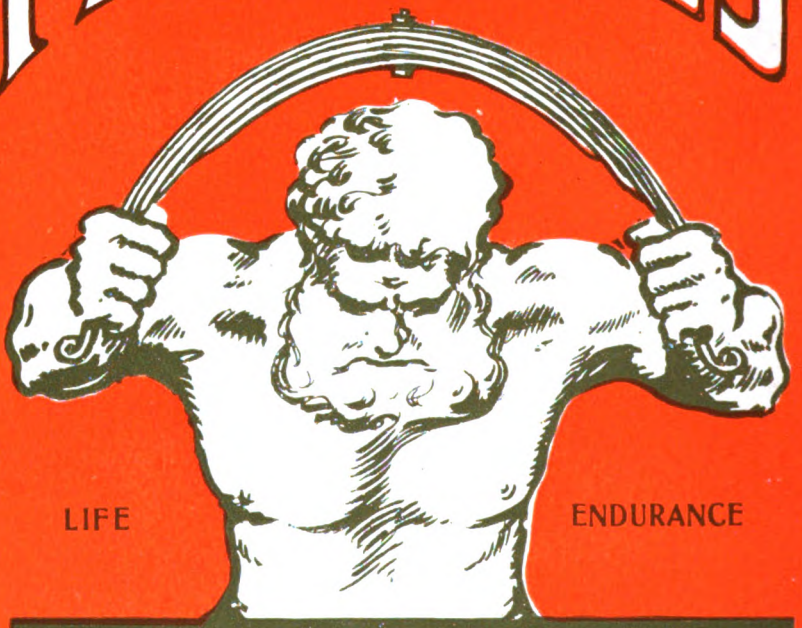
PENN SPRINGS



ELASTICITY, STRENGTH
AND UNIFORMITY

MEANS SATISFACTION

These results come from our scientific treatment of the steel combined with skilled workmanship.

PENN SPRING WORKS

R. K. DAVIS, Sales Manager

Sales Office
1047 David Whitney Bldg.,
Detroit, Mich.

Factory
Baldwinsville, N. Y.

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Part IV

MACHINERY, TOOLS, SHOP EQUIPMENT AND SUPPLIES

ANVILS

BLACKSMITHS AND MACHINISTS ANVILS

BALDWIN, Tuthill & Bolton, Grand Rapids, Mich.

COLUMBIAN Hardware Co., Cleveland, O.

COLUMBUS Forge & Iron Co., Columbus, O. "Trenton."
(See page 515.)

EAGLE—See Fisher & Norris.

FISHER & Norris, Trenton, N. J. "Eagle."

HAY-BUDDEN Mfg. Co., Brooklyn, N. Y.

ILLINOIS Iron & Bolt Co., Carpentersville, Ill.

PETER WRIGHT—See Wiebusch & Hilger.

TRENTON—See Columbus Forge & Iron Co.

WIEBUSCH & Hilger, New York, N. Y. (Importers.) "Peter Wright."

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
(See page 121.)

HENDERSON Bros., Waterbury, Conn.

LAUER Machine Co., John, Detroit, Mich.

McCORMICK Co., J. S., Pittsburg, Pa.

NORTHERN Engineering Works, 2 Chene St., Detroit, Mich.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa.
(See page 725.)

PERKINS Co., Henry, Bridgewater, Mass.

ROYERSFORD Foundry & Machine Co., Royersford, Pa.

SLY Mfg. Co., W. W., Cleveland, O.

WADSWORTH Core Machine & Equipment Co., Akron, O.

WHITING Foundry Equipment Co., Harvey, Ill.

BAGS

SHIPPING BAGS

CENTRAL Bag Mfg Co., 3622-30 S. Iron St., Chicago, Ill.
(See page 689.)

BALLS

BURNISHING BALLS

ABBOTT Ball Co., Elmwood, Conn.

BARRELS

TUMBLING BARRELS

ABBOTT Ball Co., Elmwood, Conn.

BAIRD Machine Co., Bridgeport, Conn.

BARNETT Foundry Co., Oscar, Irvington, N. J.

CALUMET Foundry Equipment Co., Harvey, Ill.

BARS

BORING BARS

ALLEN & Curtiss Co., Mishawaka, Ind. "Simpl."
(See page 807.)

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill.
(See page 707.)

CARR—See Thompson & Son Co.

CELFOR Tool Co., Buchanan, Mich.

CLOUGH, R. M., Tolland, Conn.

DAVIS Boring Tool Co., St. Louis, Mo.

KRIEGER Tool & Mfg. Co., Grand Rapids, Wis.

MARVIN & Casler Co., Canastota, N. Y.

O. K. Tool Holder Co., Shelton, Conn.

READY Tool Co., Bridgeport, Conn. "Red-E."

RED-E—See Ready Tool Co.

SIMPL—See Allen & Curtis Co.

THOMPSON & Son Co., Henry G., New Haven, Conn. "Carr."

UNIVERSAL Boring Machine Co., Hudson, Mass.

WOODS Engineering Co., Alliance, O.

Complete Index to Classification appears on Pages 8 to 27.

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BASKETS

DIPPING BASKETS

CLINTON Wire Cloth Co., Clinton, Mass.

SMITH, Edward F., New Haven, Conn.

BEARINGS

OILLESS BEARINGS

ARGUTO Oilless Bearing Co., Philadelphia, Pa.

BELLOWS

HAND BELLOWS

(Blacksmiths and Molders)

BRAND Co., S. H., Chicago, Ill.

CHRISTEN Bellows & Mfg. Co., St. Louis, Mo.

DOBSON, Wm., Canastota, N. Y.

HILL & Griffith Co., Cincinnati, O.

OSBORN Mfg. Co., Cleveland, O.

WOODASON, Thos., Philadelphia, Pa.

BENDERS

ANGLE BENDERS

(Hand Power)

BERTSCH & Co., Cambridge City, Ind.

EXCELSIOR Tool & Machine Co., East St. Louis, Ill. "X L C R."

HINMAN & Co., D. A., Sandwich, Ill.

WALLACE Supplies Mfg. Co., Chicago, Ill.

X L C R—See Excelsior Tool & Machine Co.

BITS

AUGER BITS

CONNECTICUT Valley Mfg. Co., Centerbrook, Conn.

DRUSE, J. S., Chester, Conn.

FOREST City Bit & Tool Co., Rockford, Ill.

FORSTNER—See Progressive Mfg. Co.

GREENLEE Bros. & Co., Rockford, Ill.

IRWIN Auger Bit Co., Wilmington, O.

IVES Mfg. Co., W. A., Wallingford, Conn. "Mephisto."

JENNINGS & Co., C. E., New York, N. Y.

KILBORN & Bishop Co., New Haven, Conn. "Lavigne."

LAVIGNE—See Kilborn & Bishop Co.

MEPHISTO—See Ives Mfg. Co.

OHIO Tool Co., Charleston, W. Va.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PROGRESSIVE Mfg. Co., Torrington, Conn. "Forstner."

RUSSELL-JENNINGS Mfg. Co., Chester, Conn.

SNELL Mfg. Co., Fiskdale, Mass.

SWAN Co., Jas., Seymour, Conn.

BLACKBOARDS

COMPOSITION BLACKBOARDS

HAMMETT Co., J. L., Brooklyn, N. Y. "Hyloplate."

HYLOPLATE—See Hammett Co.

BLADES

HACK SAW BLADES

(For Hack Saw Frames—See Frames, Hack Saw)

A. A. A.—See Atkins & Co.

ARROW HEAD—See Jennings & Co.

ATKINS & Co., E. C., Indianapolis, Ind "A. A. A."

BOSTON Saw & Tool Co., Boston, Mass "Knoxall."

CHROMOL—See Disston & Sons.

DIAMOND Saw & Stamping Works, Buffalo, N. Y. "Sterling."

DISSTON & Sons, Henry, Philadelphia, Pa. "Chromol."

EUREKA—See Thompson & Son Co.

GOODELL-PRATT Co., Greenfield, Mass.

GRIFFIN Co., G. W., Franklin, N. H.

JENNINGS & Co., C. E., New York, N. Y. "Arrow Head."

KNOXALL—See Boston Saw & Tool Co.

MASSACHUSETTS Saw Works, Springfield, Mass. "Victor."

MILFORD—See Thompson & Son Co.

MILLERS Falls Co., Millers Falls, Mass. "Star."

QUALITY Saw & Tool Works, Springfield, Mass.

RACINE Tool & Machine Co., Racine, Wis.

SIMONDS Mfg. Co., Fitchburg, Mass.

SIMPLEX Tool & Supply Co., Boston, Mass.

STAPF & Co., John B., Dunkirk, N. Y.

STAR—See Millers Falls Co.

STERLING—See Diamond Saw & Stamping Works.

TT.—See Thompson & Son Co.

THOMPSON & Son Co., Henry G., New Haven, Conn. "Milford," "Eureka," "XL," "TT."

UNIVERSAL—See West Haven Mfg. Co.

UTILITY—See West Haven Mfg. Co.

VICTOR—See Massachusetts Saw Works.

WEST Haven Mfg. Co., New Haven, Conn "Universal," "Utility."

XL—See Thompson & Son Co.

Complete Index to Classification appears on Pages 8 to 27.

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Why P. & W. Taps Win

It's in the Design

One-third of the land from the cutting edge is concentric.

The remaining two-thirds has eccentric relief.

The taper-tap has a cylindrical pilot.

The taper- and plug-taps have an eccentrically relieved chamfer relieved clear from the cutting edge.

The highest grade of steel obtainable is used.

What It Means to You

Taps can be sharpened at the only correct point—on the face of the cutting edge.

Sharpening in no way affects their size.

Can be sharpened long after other so-called eccentrically relieved taps are rendered useless.

We obtain the freest cutting tap with the longest life—an exclusive combination.

Accuracy nowhere else obtainable is secured together with a degree of finish and refinement heretofore thought impossible with a commercial tool.

For a number of years we have made taps with this style of relief. They have won out steadily and consistently on merit alone.

The Tap with the

(Trade Mark)

Con-eccentric Land

(Registered U. S. Patent Office)

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HARTFORD, CONN.

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PHILADELPHIA.....405 N. 21st St.
CLEVELAND.....730 Superior Ave.
DETROIT.....Kerr Machy. Bldg.
CHICAGO,
W. Washington Blvd. & N. Jefferson St.
ST. LOUIS.....516 North 3rd St.
CINCINNATI.....336 W. Fourth St.
BIRMINGHAM, ALA..2015 First Ave.
ST. PAUL, MINN.,
Robinson, Cary & Sands Co.
DENVER, COLO.,
Hendrie & Bolthoff Mfg. & Supply Co.
SEATTLE, WASH.,
Hallidie Machinery Co.

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BLOCKS

CHAIN BLOCKS

(See Cranes, Portable)

BLOWERS

PRESSURE BLOWERS

ABC—See American Blower Co.

AMERICAN Blower Co., Detroit, Mich. "ABC."

AMERICAN Gas Furnace Co., 24 John St., New York, N. Y. (See page 721.)

BUFFALO Forge Co., Buffalo, N. Y.

CANEDY-OTTO Mfg. Co., Chicago Heights, Ill. "Royal," "Western Chief."

CHAMPION Blower & Forge Co., Lancaster, Pa.

CONNERSVILLE Blower Co., Connersville, Ind.

HOYSRADT & Case, Kingston, N. Y.

NATIONAL Blower Works, Milwaukee, Wis.

NEW York Blower Co., Chicago, Ill.

PIQUA Blower Co., Piqua, O.

ROOTS Co., P. H. & F. M., Connersville, Ind.

ROYAL—See Canedy-Otto Mfg. Co.

U. S. Gas Machine Co., Muskegon, Mich.

WESTERN CHIEF—See Canedy-Otto Mfg. Co.

WILBRAHAM-GREEN Blower Co., Pottstown, Pa.

BOBS

PLUMB BOBS

ACME—See Millers Falls Co.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BROWN & Sharpe Mfg. Co., Providence, R. I.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

READING Hardware Co., Reading, Pa.

STANLEY Rule & Level Co., New Britain, Conn.

STARRETT Co., L. S., Athol, Mass.

BOOKS

ACCOUNTING AND COST SYSTEM BOOKS

GARAGE Systems Co., Dept. D., 110 N. Main St., Rockford, Ill. (See page 745.)

BOXES

ANNEALING AND CASE HARDENING BOXES

HESS Steel Co., Bridgeton, N. J.

KNOX Pressed & Welded Steel Co., Pittsburg, Pa.

LEETONIA Boiler Co., Leetonia, O.

McNEIL & Bro. Co., Jas., Pittsburg, Pa.

MESTA Machine Co., Pittsburgh, Pa.

OHIO Mfg. Co., Painesville, O.

PITTSBURGH Annealing Box Co., Pittsburgh, Pa.

TOLEDO Steel Casting Co., Toledo, O.

HOSE BOXES

HALE Electric & Engineering Co., Cleveland, Ohio.

MITRE BOXES

ACME—See Millers Falls Co.

AYER—See Marsh Co.

BRIDGEPORT Engineering Co., Bridgeport, Conn.

GOODELL Mfg. Co., Greenfield, Mass. "Greenfield."

GREENFIELD—See Goodell Mfg. Co.

LANGDON—See Marsh Co.

LANGDON—See Millers Falls Co.

MARSH Co., H. C., Rockford, Ill. "Langdon," "Ayer."

MILLERS Falls Co., Millers Falls, Mass. "Langdon," "Acme."

OLMSTED'S Son, L. H., Hasbrouck Heights, N. J.

ROCKFORD Mitre Box Co., Rockford, Ill.

STANLEY Rule & Level Co., New Britain Conn.

SHEET METAL TOTE BOXES

ALLSTEELEQUIP Co., Aurora, Ill.

CLARK Co., W. J., Salem, O.

CLEVELAND Wire Spring Co., Cleveland, O

HETTS Co., Detroit, Mich.

HART & Hutchinson Co., New Britain, Conn.

KILBOURNE & Jacobs Mfg. Co., Columbus, O

LEETONIA Boiler Co., Leetonia, O.

LYON Metallic Mfg. Co., Aurora, Ill. (See page 715.)

N. B.—See New Britain Machine Co.

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn. "N. B." (See page 753.)

OHIO Mfg. Co., Painesville, O.

STERLING Wheelbarrow Co., Milwaukee, Wis.

STEAM WOOD BENDING BOXES OR RETORTS

PERFECTION Wood Steaming Retort Co. Parkersburg, W. Va.

Complete Index to Classification appears on Pages 8 to 27.

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CLARK AMMETERS

Model 205
Flush Mounting
Silver Dial
Polish Nickel Case
Diameter of Body
2⅜"
Diameter of Flange
2¾"

D'eArsonvall Type specially designed for automobile use. Dials—etched brass.

Base—die cast—with shunt chamber separate from interior of meter thus preventing injury to magnets or moving parts due to excessive heating of shunt, caused by short circuits or overloads.

Finish—Polished nickel or Black japan—polished copper or brush brass at the same price.

Quotations upon manufacturers' requirements—to the trade—upon request.

Model 205
Black Dial
Japanned Case
Otherwise same as Silver Dial instrument

Clark Electric Meter Company

1330 Twelfth St., DETROIT, MICH.

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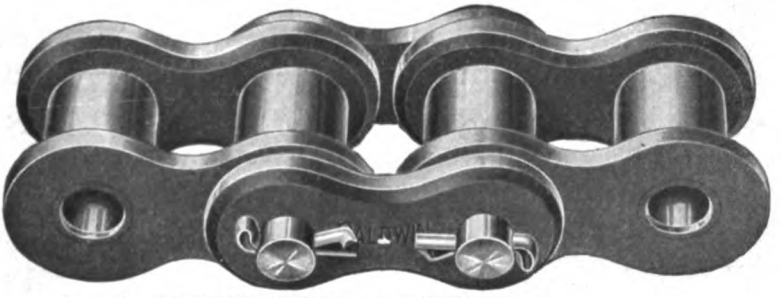

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Walter H. Williams, 175 Massachusetts Ave., Boston, Mass.
Motor & Machinists Supply Co., Kansas City, Mo.
M. A. Bryte, 788 Mission St., San Francisco, Cal.
M. & M. Co., Cleveland, Ohio.
Neustadt Automobile & Supply Co., St. Louis, Mo.
C. J. Smith, St. Paul, Minn.

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BRACES

BIT BRACES

AMERICAN—See Turner & Deegan.

BARBER—See Millers Falls Co.

BARBERS—See Turner & Deegan.

FRAY Co., John S., Bridgeport, Conn.

GOODELL-PRATT Co., Greenfield, Mass.

HOLDALL—See Millers Falls Co.

MILLERS Falls Co., Millers Falls, Mass. "Barber," "Holdall."

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

STANLEY Rule & Level Co., New Britain, Conn.

TURNER & Deegan, Bristol, Conn. "American," "Barbers."

BRASS

BRAZING BRASS

AMERICAN Brass Co. (Waterbury Brass Branch), Waterbury, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CRESCENT—See North American Smelting Co.

LISSBERGER & Son, Marks, Long Island City, N. Y.

MILLER Metalwork Co., 411 St. Paul's Ave., Jersey City, N. J. (See page 751.)

NAULTY, James, Philadelphia, Pa.

NORTH American Smelting Co., Philadelphia, Pa. "Crescent."

PEERLESS Welding Co., New York, N. Y.

BROOMS

STEEL WIRE BROOMS

(For cleaning garage floors)

AMERICAN Wire Brush Co., New York, N. Y. "Minerva."

MINERVA—See American Wire Brush Co.

OSBORN Mfg. Co., Cleveland, O.

BRUSHES

FOUNDRY AND SHOP BRUSHES

CAPITOL—See Indianapolis Brush & Broom Co.

FLINT, Warren F., Boston, Mass.

INDIANAPOLIS Brush & Broom Co., Indianapolis, Ind. "Capitol."

MASON Brush Works, Worcester, Mass.

OSBORN Mfg. Co., Cleveland, O.

PAINT AND VARNISH BRUSHES

AERON—See De Vilbiss Mfg. Co.

BOARS HEAD—See Fisher-Mitchell Co.

BRADLEY & Smith, New York, N. Y.

BUFFALO Air Brush Co., Buffalo, N. Y. "Presto."

BURTON & Co., A. E., Boston, Mass.

CLINTON & Co., E., Philadelphia, Pa.

DE VILBISS Mfg. Co., Toledo, O. "Aeron."

DEVOE & C. T. Raynolds Co., F. W., New York, N. Y.

ECLIPSE Air Brush & Compressor Co., Newark, N. J.

FISHER-MITCHELL Co., New York, N. Y. "Boars Head."

FRENCH & Co., Samuel H., Philadelphia, Pa

GERTS, Lumbard & Co., Chicago, Ill.

HANLON & Goodman Co., New York, N. Y.

LUCAS & Co., John, Philadelphia, Pa.

MILES Bros. & Co., Brooklyn, N. Y.

OSBORN Mfg. Co., Cleveland, O.

PACKARD Co., A., Boston, Mass.

PRESTO—See Buffalo Air Brush Co.

RODRIGUEZ, R. E., New York, N. Y.

RUBBERSET Co., Newark, N. J.

THAYER & Co., P. E. Pawtucket, R. I.

THUM, Chas. D., Philadelphia, Pa.

UNITED Brush Manufactories, New York, N. Y.

WHITING-J. J. ADAMS Co., John L., Boston, Mass. (See page 665.)

VARNISH BRUSHES

(See Brushes, Paint and Varnish)

BUFFERS

ELECTRIC PORTABLE BUFFERS

(See Drills, Electric Portable)

BULLDOZERS

AJAX Mfg. Co., Cleveland, O.

LONG & Allstatter Co., Hamilton, O.

NILES-BEMENT-POND Co., New York, N. Y

ROCK River Machine Co., Janesville, Wis.

WILLIAMS, White & Co., Moline, Ill.

CALIPERS

CALIPERS AND DIVIDERS

(For Micrometer Calipers—See Micrometers)

A. M. C.—See Athol Machine Co.

ATHOL Machine Co., Athol, Mass. "Premier," "A. M. C."

BROWN & Sharpe Mfg. Co., Providence, R. I.

COLUMBIA—See Smith, E. G.

COPELANDS—See Eagan, Thos. F.

EAGAN, Thos. F., Worcester, Mass. "Copelands."

FAY—See Starrett Co.

GOODELL-PRATT Co., Greenfield, Mass.

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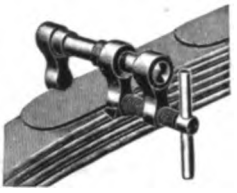

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must be lubricated to preserve them.

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CALIPERS (Continued)

CALIPERS AND DIVIDERS (Continued)

JOHNSON, Wm., Newark, N. J.

LOWENTRAUT Mfg. Co., P., Newark, N. J.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PREMIER—See Athol Machine Co.

SMITH, E. G., Tampa, Fla. "Columbia."

STARRETT Co., L. S., Athol, Mass. "Fay," "Yankee."

UNION Caliper Co., Orange, Mass.

YANKEE—See Starrett Co.

CANS

GASOLINE CANS

(For Garage use)

AMERICAN Can Co., New York, N. Y. "Canco."

ATLANTIC Stamping Co., Rochester, N. Y.

BEMAN Automatic Oil Can Co., Meadville, Pa.

CANCO—See American Can Co.

CENTRAL Stamping Co., New York, N. Y.

DELPHOS Mfg. Co., Delphos, O.

DOVER Stamping & Mfg. Co., Cambridge, Mass.

EAMES, John C., New York, N. Y. "McNutt."

JUSTRITE Mfg. Co., Chicago, Ill.

McNUTT—See Eames, John C.

NATIONAL Enameling & Stamping Co., New York, N. Y.

NON-EXPLOSIVE Can Co., Chicago, Ill. "Peerless."

PEERLESS—See Non-Explosive Can Co.

ROCHESTER Can Co., Rochester, N. Y.

SEXTON Can Co., Boston, Mass.

VOGEL & Bros., Wm., Brooklyn, N. Y.

WASTE CANS

(Receptacles for oily and dirty waste)

A-H Mfg. Co., Cleveland, O.

ATLANTIC Stamping Co., Rochester, N. Y.

AUTO Metal Co., 531 Worthington St., Springfield, Mass. (See page 107.)

CENTRAL Stamping Co., New York, N. Y.

CLARK Co., W. J., Salem, O.

CLEVELAND Wire Spring Co., Cleveland, O.

DELPHOS Mfg. Co., Delphos, O.

DIAMOND State Fibre Co., Elsmere, Del.

DOVER Stamping & Mfg. Co., Cambridge, Mass.

DURLACH, I., New York, N. Y.

GEM Stamped Steel Co., Chelsea, Mass. (See page 479.)

JUSTRITE Mfg. Co., Chicago, Ill.

KOVEN & Bro., L. O., Jersey City, N. J.

KRAFT, A. C., Chicago, Ill. "Nacefas."

NACEFAS—See Kraft, A. C.

ROCHESTER Can Co., Rochester, N. Y.

WALL Mfg. Supply Co., P., Pittsburg, Pa.

WALTERS Mfg. Co., Pittsburgh, Pa.

CASES

BOLT AND SCREW CASES

AMERICAN Bolt & Screw Case Co., Dayton, O. (See page 667.)

HOBART Bros. Co., Troy, O.

CHAPLETS

FOUNDRY CHAPLETS

BURDICK & Son, Albany, N. Y.

CHAMPION Machine & Forging Co., 3725 E. 78th St., Cleveland, O. (See page 831.)

CLEVELAND Chaplet & Mfg. Co., Cleveland, O.

CRESCENT Brass & Pin Co., Detroit, Mich.

GEM Mfg. Co., Pittsburg, Pa.

HASKINS—See Hill & Griffith Co.

HILL & Griffith Co., Cincinnati, O. "Peerless," "Haskins."

LINDSAY & Co., W. W., Philadelphia, Pa.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

PEERLESS—See Hill & Griffith Co.

PHILADELPHIA Chaplet & Mfg. Co., Philadelphia, Pa.

UNITED States Chaplet & Supply Co., New York, N. Y.

CHISELS

CAPE CHISELS

(See Chisels, Cold and Cape)

COLD AND CAPE CHISELS

ATHA Tool Co., Newark, N. J.

BEALL Bros., Alton, Ill.

BICKNELL Mfg. & Supply Co., Janesville, Wis.

BILLINGS & Spencer Co., Hartford, Conn.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BUCK Bros., Milbury, Mass.

BUFFUM Tool Co., Louisiana, Mo.

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CHISELS (Continued)

COLD AND CAPE CHISELS (Continued)

CARVER Tool Works, Spring Valley, N. Y.
CINCINNATI Tool Co., Norwood, O. "Hargrave."
CRONK & Carrier Mfg. Co., Elmira, N. Y.
DIAMOND—See Whitman & Barnes Mfg. Co.
DREW & Co., C., Kingston, Mass.
EVANSVILLE Tool Works, Evansville, Ind.
HARGRAVE—See Cincinnati Tool Co.
HUBBARD & Co., Pittsburg, Pa.
JOHNSON, Wm., Newark, N. J.
K. & B.—See Kilborn & Bishop Co.
KILBORN & Bishop Co., New Haven, Conn "Silex," "K. & B."
KLEIN-LOGAN Co., Pittsburg, Pa.
KRAEUTER & Co., Newark, N. J.
LOWENTRAUT Mfg. Co., P., Newark, N. J.
MARCY Tool Works, Putnam, Conn.
MAYDOLE Hammer Co., David, Norwich, N. Y.
MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo. (See page 747.)
NOONAN Tool & Machine Co., A. S., Rome, N. Y.
OHIO Tool Co., Charleston, W. Va.
PECK, Stow & Wilcox Co., Southington, Conn "Pexto."
PEXTO—See Peck, Stow & Wilcox Co.
RED HEAD—See S. & I. Co.
S. & I. Co., Springfield, Mass. "Red Head."
SCHUTTE & Co., E. G., Cincinnati, O.
SHARPENEZY—See Smith & Co.
SILEX—See Kilborn & Bishop Co.
SMITH & Co., H. D., Plantsville, Conn. "Sharpenezy."
SNELL Mfg. Co., Fiskdale, Mass.
STORTZ & Son, John, Philadelphia, Pa.
SYRACUSE Twist Drill Co., Syracuse, N. Y.
TUCK Mfg. Co., Brockton, Mass.
VAUGHAN & Bushnell Mfg. Co., Chicago, Ill.
VERONA Tool Works, Pittsburg, Pa.
VLCHEK Tool Co., Cleveland, O.
WARNER Hammer Co., Cromwell, Conn.
WHITMAN & Barnes Mfg. Co., Akron, O. "Diamond."

WOODWORKERS CHISELS AND GOUGES

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.
BUCK Bros., Milbury, Mass.
GREENLEE Bros. & Co., Rockford, Ill.
JENNINGS & Co., C. E., New York, N. Y.
MACK & Co., Rochester, N. Y.
OHIO Tool Co., Charleston, W. Va.
PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."
PEXTO—See Peck, Stow & Wilcox Co.
RED HEAD—See S. & I. Co.
S. & I. Co., Springfield, Mass. "Red Head."
SWAN Co., Jas., Seymour, Conn.
WHITE Co., L. & I. J., Buffalo, N. Y.
WINSTED Edge Tool Works, Winsted, Conn.

CHOCKS

CAR SHIPPING CHOCKS, BLOCKS AND CLAMPS

CROFOOT Mfg. Co., Findlay, O.
FLEMMING Vehicle Chock Co., Washington, D. C.
ROHE Traction Block Co., Kenmare, N. D.

CHUCKS

BORING MILL CHUCKS

GISHOLT Machine Co., Madison, Wis.
HORTON & Son Co., E., Windsor Locks, Conn.
UNION Mfg. Co., New Britain, Conn.
WESTCOTT Chuck Co., Oneida, N. Y.

DRILL CHUCKS

ALMOND Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass. (See page 547.)
AUTOMATIC Drill Chuck Corp., Detroit, Mich "Quictite."
CELFOR Tool Co., Buchanan, Mich.
CUSHMAN Chuck Co., Hartford, Conn.
DETROIT Twist Drill Co., Detroit, Mich. "Graham." (See page 687.)
GOODELL Mfg. Co., Greenfield, Mass. "Greenfield."
GOODELL-PRATT Co., Greenfield, Mass.
GRAHAM—See Detroit Twist Drill Co.
GREENFIELD—See Goodell Mfg. Co.
GRONKVIST Drill Chuck Co., Jersey City, N. J. "Kupke."
HORTON & Son Co., E., Windsor Locks, Conn "Morrow."
JACOBS Mfg. Co., Hartford, Conn.
KUPKE—See Gronkvist Drill Chuck Co.
LITTLE GIANT—See Westcott Chuck Co.
McCROSKY Reamer Co., Meadville, Pa. "Wizard."
MAGIC—See Modern Tool Co.
MODERN Tool Co., Erie, Pa. "Magic."
MILLERS Falls Co., Millers Falls, Mass.

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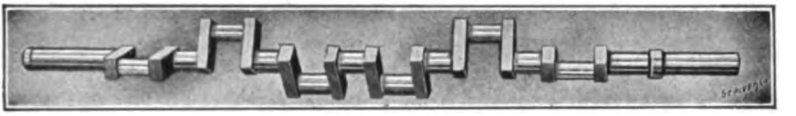

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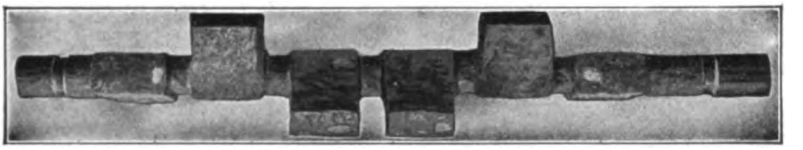

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CHUCKS (Continued)

DRILL CHUCKS (Continued)

MORROW—See Horton & Son Co.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL—See Oneida National Chuck Co.

NEW BRITAIN—See Union Mfg. Co.

ONEIDA—See Westcott Chuck Co.

ONEIDA National Chuck Co., Oneida, N. Y. "National."

PRATT Chuck Co., Frankfort, N. Y.

PRESTO—See Whitney Mfg. Co.

QUICTITE—See Automatic Drill Chuck Corp.

SKINNER Chuck Co., New Britain, Conn.

STANDARD Tool Co., Cleveland, O.

TRUMP Bros. Machine Co., Wilmington, Del.

UNION Mfg. Co., New Britain, Conn. "New Britain."

WAHLSTROM Tool Co., Brooklyn, N. Y.

WEAVER Mfg. Co., Springfield, Ill.

WESTCOTT Chuck Co., Oneida, N. Y. "Little Giant," "Oneida."

WHITNEY Mfg. Co., Hartford, Conn. "Presto."
(See page 723.)

WHITON Machine Co., D. E., New London, Conn.

WIZARD—See McCrosky Reamer Co.

LATHE CHUCKS

ALMOND Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass.
(See page 547.)

AMERICAN Tool & Machine Co., Boston, Mass.

BARKER—See Thomas Elevator Co.

CUSHMAN Chuck Co., Hartford, Conn.

HOGGSON & Pettis Mfg. Co., New Haven, Conn. "Sweetland."

HORTON & Son Co., E., Windsor Locks, Conn.

ONEIDA National Chuck Co., Oneida, N. Y.

SKINNER Chuck Co., New Britain, Conn.

SWEETLAND—See Hoggson & Pettis Mfg. Co.

THOMAS Elevator Co., Chicago, Ill. "Barker."

UNION Mfg. Co., New Britain, Conn.

WESTCOTT Chuck Co., Oneida, N. Y.

WHITON Machine Co., D. E., New London, Conn.

MAGNETIC CHUCKS

D. & W. Fuse Co., Providence, R. I.

HEALD Machine Co., Worcester, Mass.

WALKER Co., O. S., Worcester, Mass.

MILLING MACHINE CHUCKS

HORTON & Son Co., E., Windsor Locks, Conn.

ONEIDA National Chuck Co., Oneida, N. Y.

SKINNER Chuck Co., New Britain, Conn.

WESTCOTT Chuck Co., Oneida, N. Y.

PLANER CHUCKS

BARTLETT, Edwin E., Boston, Mass.

HORTON & Son Co., E., Windsor Locks, Conn.

SKINNER Chuck Co., New Britain, Conn.

UNION Mfg. Co., New Britain, Conn.

PNEUMATIC CHUCKS

AEROCHUCK—See Manufacturers Equipment Co.

MANUFACTURERS Equipment Co., Chicago Ill. "Aerochuck."

SCREW MACHINE CHUCKS

HORTON & Son Co., E., Windsor Locks, Conn.

ONEIDA National Chuck Co., Oneida, N. Y.

CLAMPS

MACHINISTS CLAMPS

ATHOL Machine Co., Athol, Mass.

BILLINGS & Spencer Co., Hartford, Conn.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CINCINNATI Tool Co., Norwood, O. "Hargrave.

FORT DEARBORN Mfg. Co., Sterling, Ill.

GOODELL-PRATT Co., Greenfield, Mass.

HARGRAVE—See Cincinnati Tool Co.

LE COUNT, Wm. G., S. Norwalk, Conn.

MARK Mfg. Co., Chicago, Ill.

MASSEY Vise Co., Chicago, Ill.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

PHOENIX Hardware Co., Buffalo, N. Y.

STARRETT Co., L. S., Athol, Mass.

TAYLOR Mfg. Co., James L., Poughkeepsie, N. Y.

WILLIAMS & Co., J. H., Brooklyn, N. Y.

WOODWORKERS CLAMPS

ALDRICH Co., Wm. K., Lowell, Mass.

BATAVIA Clamp Co., Batavia, N. Y. "Colts."

BAY STATE—See Cutter, Geo. A.

BUFFALO—See Josef Mfg. Co.

CHAPIN-STEPHENS Co., Pine Meadow, Conn.

CINCINNATI Tool Co., Norwood, O. "Hargrave."

COLTS—See Batavia Clamp Co.

CUTTER, Geo. A., Taunton, Mass. "Bay State."
(See page 765.)

DANN Bros. & Co., New Haven, Conn.

DETROIT Screw Works, Detroit, Mich. "Reno."
(See page 849.)

EAGLE—See Woodruff & Sons Co.

Complete Index to Classification appears on Pages 8 to 27.

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Complete line of Plain and Fancy Morocco Covered Cases. Mahogany, Circassian Walnut and Birdseye Maple, fancy wood cases.

Cases furnished for all standard makes of Gasoline or Electric cars. Broom and Watch holders.

Fancy leathers in full skins or cut sizes to match automobile trimmings. A large and well equipped factory doing contract and special work.

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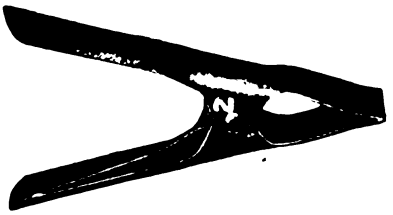

A strong, well made, all-in-one tool which takes the place of hand vice, wrench, pliers, wire stripper and tube-patching tools. Opens 1¾ inches.

Indispensable in garages and wanted by all car owners.

Get our jobbers' offer—your dealers are looking for this tool.

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An oil cleaner that takes the place of soap and water and rebuilds the finish and preserves the original lustre of a car. Thorough, quick, simple. In use everywhere. List price ½-gal. cans, $1.50—gallon cans, $2.50. Send for trade discounts.

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Hydraulic Dynamometers for motor block test or chassis test in factories.

Steering Wheels for Ford cars, 17" diameter. The larger wheel is desirable because of increased leverage making steering easier.

Priming Cups with Fibre hand piece, which insulates against heat.

Tool cases made of steel with tools inserted in cavity to fit each tool and held in place. Handier, neater, cleaner than tool rolls.

All sizes and types oil can holders for trucks and pleasure cars.

A complete line of TERMINALS for ignition starter and lighting systems.

Tire Grips for use with clincher tires. Help to replace them.

Wrench sets for motorcycles adapted for small nuts and bolts.

Manufactured by

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CLAMPS (Continued)

WOODWORKERS CLAMPS (Continued)

EBERHARD Mfg. Co., Cleveland, O.

ERIE Stamping & Mfg. Co, Erie, Pa. "Thompson."

GRAND Rapids Hand Screw Co., Grand Rapids, Mich.

HAMMER & Co., Branford, Conn.

HARGRAVE—See Cincinnati Tool Co.

JOSEF Mfg. Co., Chicago, Ill.

MARK Mfg. Co., Chicago, Ill.

MASSEY Vise Co., Chicago, Ill.

MOUNT CARMEL—See Woodruff & Sons Co.

NATIONAL Novelty Corp., New York, N. Y.

O'NEIL, Jr., J. H., Pawtucket, R. I.

OHIO Tool Co., Charleston, W. Va.

OLIVER Machinery Co., Grand Rapids, Mich.

PALMER & Sons, Albert E., Owosso, Mich.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PHOENIX Hardware Co., Buffalo, N. Y.

RENO—See Detroit Screw Works.

TAYLOR Mfg. Co., James L., Poughkeepsie, N. Y.

THOMPSON—See Erie Stamping & Mfg. Co.

WILLIAMS & Co., J. H., Brooklyn, N. Y.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn. "Eagle," "Mount Carmel."

CLEANERS

AUTOMOBILE ENGINE CLEANERS

BINKS—See Star Brass Works.

BISHOP-BABCOCK-BECKER Co., Cleveland, O.

CLEVELAND Faucet Co., Cleveland, O.

CODMAN & Shurtleff, Boston, Mass.

DANIELS Mfg. Co., Atchison, Kans.

IDEAL—See Metal Stamping Co.

LIPMAN Air Appliance Co., Beloit, Wis. "Onceover."

METAL Stamping Co., Long Island City, N. Y. "Ideal."

ONCEOVER—See Lipman Air Appliance Co.

PROSPECT Mfg. Co., Prospect, O.

ROMORT Mfg. Co., 1810 Westlake Ave., Seattle, Wash. (See page 450.)

STAR Brass Works, Chicago, Ill. "Binks."

TURNER Brass Works, Sycamore, Ill.

WAGNER Specialty Co., New York, N. Y.

MINERAL CLEANERS

BENNETT-O'CONNELL Co., Chicago, Ill.

ELECTRIC Smelting & Aluminum Co., Lockport, N. Y.

HACHMEISTER-LIND Chemical Co., Pittsburg, Pa.

MUNNING-LOEB Co., Matawan, N. J.

RHODES & Co., J. H., Chicago, Ill.

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

CLIPPERS

BOLT AND RIVET CLIPPERS

(Hand Power)

ALLEN-RANDALL—See Porter, H. K.

CAROLUS—See Twin City Specialty Co.

CHAMBERS Bros. Co., Philadelphia, Pa.

EASY—See Porter, H. K.

ELM CITY—See Schollhorn Co.

HELWIG Mfg. Co., St. Paul, Minn.

METAL Stamping Co., Long Island City, N. Y.

NEW EASY—See Porter, H. K.

O. K.—See Porter, H. K.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PORTER, H. K., Everett, Mass. "Easy," "New Easy," "Allen-Randall," "O. K." (See page 673.)

ROBERTS Mfg. Co., Somerville, Mass. "Victor."

SCHOLLHORN Co., Wm., New Haven, Conn. "Elm City."

TWIN City Specialty Co., Sterling, Ill. "Carolus."

VICTOR—See Roberts Mfg. Co.

RIVET CLIPPERS

(See Clippers, Bolt and Rivet)

CLOCKS

TIME RECORDING AND WATCHMAN'S CLOCKS

(For Time Stamps—See Stamps, Time)

BAIRD Equipment Co., 325 W. Ohio St., Chicago, Ill. (See page 861.)

INTERNATIONAL Time Recorder Co., Endicott, N. Y.

SIMPLEX Time Recorder Co., Gardner, Mass.

COLLECTORS

DUST EXHAUST AND COLLECTOR SYSTEMS

ABC—See American Blower Co.

AMERICAN Blower Co., Detroit, Mich. "ABC."

BUFFALO Forge Co., Buffalo, N. Y.

KNICKERBOCKER Co., Jackson, Mich. "Morse-Rarefied."

MORSE-RAREFIED—See Knickerbocker Co.

PANGBORN Corp., Hagerstown, Md

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THE STANDARD NOW AND ALWAYS

Used and Preferred Everywhere

Three Styles—Five Sizes. Meet Every Need.

H. K. PORTER, Bolt Clipper Specialist

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Every car equipped with split demountable rims should carry

WEISER'S E. Z. RIM TOOL

Pulls "Easy" Holds Fast

Our terms to dealers enable them to make money by the sale of this special purpose tool. **Price $2.50**

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American Die & Tool Co.

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Any quantity. Send blue prints or sample gears for estimates.

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COMPOUNDS

BRAZING COMPOUNDS

A. & J. Mfg. Co., Chicago, Ill. "Braziron."

AALDING Mfg. Co., Manchester, N. H. (See page 739.)

ACME—See Universal Fluxine Co.

BANNER—See Cortland Specialty Co.

BRAZIRON—See A. & J. Mfg. Co.

CORTLAND Specialty Co., Cortland, N. Y. "Banner."

CORTLAND Welding Compound Co., Cortland, N. Y.

DIXON Crucible Co., Joseph, Jersey City, N. J. (See page 253.)

EVER RIGHT—See Fry, Keyser.

FLUXINE—See Krembs & Co.

FRY, Keyser, Reading, Pa. "Ever Right."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker." (See page 171.)

KAST-I-ON—See Taber, Arthur L.

KREMBS & Co., Chicago, Ill. "Fluxine."

LAFFITTE—See Phillips-Laffitte Co.

NATIONAL Cement & Rubber Co., Toledo, O

PHILLIPS-LAFFITTE Co., Philadelphia, Pa. (Importers.) "Laffitte," "Unifonte."

SCHNEIDER, Emil, Newark, N. J.

STANDARD Brazing Co., Boston, Mass. "Tichon."

STANDARD Mfg. Co., Chicago, Ill. "Superior."

SUPERIOR—See Standard Mfg. Co.

TABOR, Arthur L., Corona, Cal. "Kast-I-On."

TICHON—See Standard Brazing Co.

UNIFONTE—See Phillips-Laffitte Co.

UNIVERSAL Fluxine Co., Urbana, O. "Acme."

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa. (See page 643.)

WONDER WORKER—See Hall-Thompson Co.

BUFFING AND POLISHING COMPOUNDS

BENNETT-O'CONNELL Co., Chicago, Ill "Mascot," "Excel-All."

DIXON, Wm., New York, N. Y.

EXCEL-ALL—See Bennett-O'Connell Co.

LYMAN Co., John R., Springfield, Mass.

MASCOT—See Bennett-O'Connell Co.

MATCHLESS Metal Polish Co., New York, N. Y. "White-Diamond."

MUNNING-LOEB Co., Matawan, N. J.

STEVENS, Frederic B., Detroit, Mich. "White Rose," "White Columbia." (See pages 759 and 760.)

WHITE COLUMBIA—See Stevens, Frederic B

WHITE-DIAMOND—See Matchless Metal Polish Co.

WHITE ROSE—See Stevens, Frederic B.

WILLIAMSVILLE Buff Mfg. Co., Danielson.

CASE HARDENING COMPOUNDS

ACHILLES—See Houghton & Co.

BLACK DIAMOND—See Rogers & Hubbard Co.

BLAICH Co., Alfred O., 1956 Clybourn Ave., Chicago, Ill. (See page 675.)

BOHNITE—See Case Hardening Service Co.

CARBO—See Rodman Chemical Co.

CARBONIT—See Springfield Facing Co.

CASE Hardening Service Co., Cleveland, O. "Bohnite." (See page 675.)

DIAMOND—See European Color & Chemical Co.

EUROPEAN Color & Chemical Co., New York, N. Y. "Excelsior," "Diamond," "Monitor," "Universal."

EXCELSIOR—See European Color & Chemical Co.

GIBSON & Co., W. J., Chicago, Ill.

HAFLEIGH & Co., Philadelphia, Pa.

HOUGHTON & Co., E. F., Philadelphia, Pa. "Achilles," "Pearlite."

IDEAL Case-Hardening Compound Co., New York, N. Y.

KALUX—See Metal Hardening Solution Co.

KEYSTONE—See Rodman Chemical Co.

METAL Hardening Solution Co., Rochester, N. Y. "Kalux."

MONITOR—See European Color & Chemical Co.

MONTGOMERY Chemical Works, Baltimore, Md.

MORRIS & Co., Chicago, Ill.

MOSSO, C. A., Chicago, Ill.

PARK Chemical Co., Detroit, Mich. "Woodsides."

PEARLITE—See Houghton & Co.

PETTINOS Bros., Bethlehem, Pa.

PORTLAND—See Rogers & Hubbard Co.

RODMAN Chemical Co., East Pittsburg, Pa "Carbo." "Keystone."

ROGERS & Hubbard Co., Middletown, Conn "Black Diamond," "Standard," "Portland."

SPRINGFIELD Facing Co., Springfield, Mass. "Carbonit." (See page 691.)

STANDARD—See Rogers & Hubbard Co.

STERLINGWORTH Charcoal Co., Cambridge, Mass.

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

UNIVERSAL—See European Color & Chemical Co.

VINCENT Steel Process Co., Detroit, Mich.

WOODSIDES—See Park Chemical Co.

CORE COMPOUNDS

CATARACT Refining & Mfg. Co., Buffalo, N. Y.

EBONY—See Hill & Griffith Co.

GLUTRIN—See Robeson Process Co.

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SPARK PLUGS

The Common Sense Gasoline Savers

With the cost of Gasoline mounting higher than ever before, it is significant that the demand for REFLEX plugs has doubled and redoubled. While REFLEX SPARK PLUGS are factory equipment on Henderson Motorcycles, White, Winton and other high-grade cars, more than 90% of them are sold by our dealers direct to car owners.

Free to Dealers
A Reflex Test Plug

Tell us on your letterhead make of your car. We'll send you a Reflex free to test in your own way. Let us tell you how we help you sell more Reflex Plugs with less effort on your part and bigger profit to you. Write us now.

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2000% Increase in BOHNITE Sales in 18 Months

It's easy enough to make claims but we believe in furnishing

Convincing Proof

Write us for facts proving how we can positively eliminate your Case Hardening troubles and at the same time save you money.

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Cleveland

Case Hardening Materials

ALL THE LEADING AUTOMOBILE AND AUTO PARTS MANUFACTURERS HAVE ADOPTED

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Heinze Ignition Apparatus is Superior

in both points of construction and efficiency owing to Better Design and Material.

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FACTORIES, Lowell, Massachusetts SALES OFFICES, Detroit, Michigan
BRANCH OFFICES, New York, Detroit, Chicago, Kansas City

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COMPOUNDS (Continued)

CORE COMPOUNDS (Continued)

HILL & Griffith Co., Cincinnati, O. "Ebony," "Linoline."

KING KORE KOMPOUND—See Stevens, Frederic B.

LINOLINE—See Hill & Griffith Co.

McCORMICK Co., J. S., Pittsburg, Pa.

MILLS Mfg. Co., H. E., Syracuse, N. Y.

OBERMAYER Co., S., Cincinnati, O.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. (See page 725.)

ROBESON Process Co., New York, N. Y. "Glutrin."

STEVENS, Frederic B., Detroit, Mich. "King Kore Kompound." (See pages 759 and 760.)

VAN TILBURG Oil Co., Minneapolis, Minn. "Vanco."

VANCO—See Van Tilburg Oil Co.

POLISHING COMPOUNDS

(See Compounds, Buffing and Polishing)

WELDING COMPOUNDS

BANNER—See Cortland Specialty Co.

CORTLAND Specialty Co., Cortland, N. Y. "Banner," "Excelsior."

CORTLAND Welding Compound Co., Cortland, N. Y.

DINGEE, Mont. H., Lynchburg, Va. "Sparger's."

EXCELSIOR—See Cortland Specialty Co.

KREMBS & Co., Chicago, Ill. "Weldine."

SPARGER'S—See Dingee, Mont. H.

UNIVERSAL Fluxine Co., Urbana, O.

WELDINE—See Krembs & Co.

COUNTERBORES

CLEVELAND Twist Drill Co., Cleveland, O.

CLOUGH, R. M., Tolland, Conn.

ECLIPSE Interchangeable Counterbore Co., Detroit, Mich.

KENDRICK & Davis Co., Lebanon, N. H.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL Twist Drill & Tool Co., Detroit, Mich.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

WELLS & Son Co., F. E., Greenfield, Mass.

COUNTERSINKS

BILLINGS & Spencer Co., Hartford, Conn.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BRUBAKER & Bros., W. L. Millersburg, Pa.

CELFOR Tool Co., Buchanan, Mich.

CINCINNATI Tool Co., Norwood, O. "Hargrave."

CLEVELAND Twist Drill Co., Cleveland, O.

DETROIT Twist Drill Co., Detroit, Mich. (See page 687.)

DEUSE, J. S., Chester, Conn.

DIAMOND—See Whitman & Barnes Mfg. Co.

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

HARGRAVE—See Cincinnati Tool Co.

JOHNSON, Wm., Newark, N. J.

K & B—See Kilborn & Bishop Co.

KENDRICK & Davis Co., Lebanon, N. H.

KILBORN & Bishop Co., New Haven, Conn. "K & B."

LOWENTRAUT Mfg. Co., P., Newark, N. J.

MAYHEW Co., H. H., Shelburne Falls, Mass.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL Twist Drill & Tool Co., Detroit, Mich.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

SNELL Mfg. Co., Fishdale, Mass.

STANDARD Tool Co., Cleveland, O.

STARRETT Co., L. S., Athol, Mass.

SWAN Co., Jas., Seymour, Conn.

SYRACUSE Twist Drill Co., Syracuse, N. Y.

TUCK Mfg. Co., Brockton, Mass.

VAUGHAN & Bushnell Mfg. Co., Chicago, Ill.

WELLS & Son Co., F. E., Greenfield, Mass.

WHITMAN & Barnes Mfg. Co., Akron, O. "Diamond."

CRANES

PORTABLE CRANES, HOISTS AND CHAIN BLOCKS

ACME—See Moore Co.

ALBEN Co., Milwaukee, Wis.

BOSTON & Lockport Block Co., Boston, Mass.

BROWN Hoisting Machinery Co., Cleveland, O. "Brownhoist."

BROWNHOIST—See Brown Hoisting Machinery Co.

CAMERON Engineering Co., Washington, N. J.

CANTON Foundry & Machine Co., Canton, O. (See page 677.)

CHISHOLM-MOORE Mfg. Co., Cleveland, O. "Cyclone."

CYCLONE—See Chisholm-Moore Mfg. Co.

FORD Chain Block & Mfg. Co., Philadelphia, Pa. "Tribloc."

FRANKLIN Portable Crane & Hoist Co., Franklin, Pa.

GIANT Cable Hoist Co., Cleveland, O. "Pullifter." (See page 677.)

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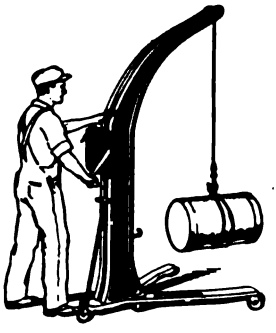
The Pullifter Portable Crane

Pullifter Attached.

Capacity 1000 lbs. Weight 200 lbs. Price Complete $50.00, f. o. b. Cleveland, O. Especially Designed for Machine Shops, Factories, Garages and other places where light portables can be used to advantage.

Price of Crane Separate $35.00 net F. O. B. Cleveland



Price of Pullifter Separate with 25-feet ¼-inch Steel Cable, $20.00 net F. O. B. Cleveland.

Manufactured by

The Giant Cable Hoist Co.

Cleveland, O.

PORTABLE CRANE AND HOIST

Notice the long easy curve of columns, which gives great strength. Pinions supplied are strengthened by a heavy shroud, and never break. Metal in bed-plate is much heavier at the end where columns are joined. This is the weak place in many cranes. By means of crank handle the bed-plate is allowed to rest on the axle outside of the front wheels, when handle is thrown up, thus locking the crane in position.

All Machines Have Roller Bearings

Write for further information

S. G. Milton & Son

Franklin, Pa.

DETROIT OILERS SAVE WEAR AND TEAR

Detroit Mechanical Force Feed Oilers give *right* lubrication at all times.

There is no chance of the damage which comes from faulty lubrication—no opportunity for burned out bearings, scored pistons and cylinders, loose fitting parts and the big repair bills which follow.

Detroit Oilers prevent quick depreciation and lost power. They are a guaranty of service uninterrupted by faulty lubrication.

Detroit Oilers are made for every kind of engine—commercial truck, automobile, gas tractor, marine and stationary—with pulley, ratchet, gear, sprocket or direct drive for easy installation. Write today for Catalog F-62.

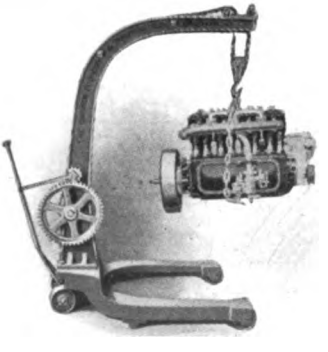
DETROIT LUBRICATOR COMPANY

DETROIT, U.S.A

Makers of the Stewart Carbureters

"Universal" Turntables, for pleasure cars or heavy trucks, with or without washrack in 16 ft. or 18 ft. sizes; capacity 8 to 10 tons. "Canton" Portable Crane and Hoist, capacity 2500 lbs. Lasts forever and reduces the payroll.

Send for illustrated catalog "C-20" on Turntables and "E-20" showing Cranes.



THE CANTON FOUNDRY & MACHINE CO.

CANTON, O.

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CRANES (Continued)

PORTABLE CRANES, HOISTS AND CHAIN BLOCKS (Continued)

HARRINGTON Son & Co., Edwin, Philadelphia, Pa. "Peerless."

IMPERIAL—See Ingersoll-Rand Co.

IMPERIAL—See Moore Co.

INGERSOLL-RAND Co., 11 Broadway, New York, N. Y. "Imperial." (See page 737.)

LAFAYETTE Engineering Co., Lafayette, Ind.

McGREGOR—See U. S. Auto Bumper Co.

MANLEY HILITE—See United Engine & Mfg. Co.

MILTON & Son, S. G., Franklin, Pa. (See page 677.)

MOORE Co., Franklin, Winsted, Conn. "Acme," "Imperial."

NEW Jersey Foundry & Machine Co., New York, N. Y.

NILES-BEMENT-POND Co., New York, N. Y.

PEERLESS—See Harrington Son & Co.

PULLIFTER—See Giant Cable Hoist Co.

ROUND & Son, D., Cleveland, O. "Simplex," "Weston," "Superior."

SIMPLEX—See Round & Son.

SPEIDEL, J. G., Reading, Pa. (See page 689.)

STONE, Frank Porter, Chicago, Ill.

SUPERIOR—See Round & Son.

TOEPPER'S Sons, Frank, Milwaukee, Wis.

TRIBLOC—See Ford Chain Block & Mfg. Co.

U. S. Auto Bumper Co., Chicago, Ill. "McGregor."

UNION Elevator & Machine Co., Chicago, Ill. "Weston."

UNITED Engine & Mfg. Co., Hanover, Pa. "Manley Hilite."

WESTON—See Round & Son.

WESTON—See Union Elevator & Machine Co.

WRIGHT Mfg. Co., Lisbon, O.

YALE & Towne Mfg. Co., 9 E. 40th St., New York, N. Y. (See page 319.)

CRUCIBLES

METAL MELTING CRUCIBLES

BARTLEY Crucible Co., Jonathan, Trenton, N. J.

BAY State Crucible Co., Taunton, Mass.

BRIDGEPORT Crucible Co., Bridgeport, Conn.

DIXON Crucible Co., Joseph, Jersey City, N. J. (See page 253.)

GAUTIER & Co., J. H., Jersey City, N. J.

McCULLOUGH-DALZELL Crucible Co., Pittsburg, Pa.

ROSS-TACONY Crucible Co., Philadelphia, Pa.

SEIDEL, R. B., Philadelphia, Pa.

TAUNTON Crucible Co., Taunton, Mass.

CUPOLAS

FOUNDRY CUPOLAS

CALUMET Foundry Equipment Co., Harvey, Ill.

McCORMICK Co., J. S., Pittsburg, Pa.

McNEIL & Bro. Co., Jas., Pittsburg, Pa.

NEWTEN—See Northern Engineering Works.

NORTHERN Engineering Works, 2 Chene St., Detroit, Mich. "Newton."

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. "Paxson-Collian." (See page 725.)

PAXSON-COLLIAN—See Paxson Co.

WHITING Foundry Equipment Co., Harvey, Ill.

CUTTERS

BAR CUTTERS

(See Cutters, Rod and Bar)

GASKET CUTTERS

(See Cutters, Washer and Gasket)

MILLING CUTTERS

BARBER-COLMAN Co., Rockford, Ill.

BECKER Milling Machine Co., Hyde Park, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CLEVELAND Twist Drill Co., Cleveland, O.

CLOUGH, R. M., Tolland, Conn.

DETROIT Twist Drill Co., Detroit, Mich. (See page 687.)

ILLINOIS Tool Works, Chicago, Ill.

INGERSOLL Milling Machine Co., Rockford, Ill.

LINCOLN-WILLIAMS Twist Drill Co., Taunton, Mass.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL Tool Co., Cleveland, O.

NATIONAL Twist Drill & Tool Co., Detroit, Mich.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

SCREW Machine Products Corp., Providence, R. I.

STANDARD Tool Co., Cleveland, O.

TABOR Mfg. Co., Philadelphia, Pa. "Taylor-Newbold."

TAYLOR-NEWBOLD—See Tabor Mfg. Co.

THURSTON Mfg. Co., Providence, R. I.

TINDEL-MORRIS Co., Eddystone, Pa.

UNION Twist Drill Co., Athol, Mass.

UNIVERSAL Boring Machine Co., Hudson, Mass.

WHITNEY Mfg. Co., Hartford, Conn. (See page 723.)

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"HERBRAND"

Manufacturers of

Wrenches: { Automobile, Bicycle, Engineers' and Machinists'

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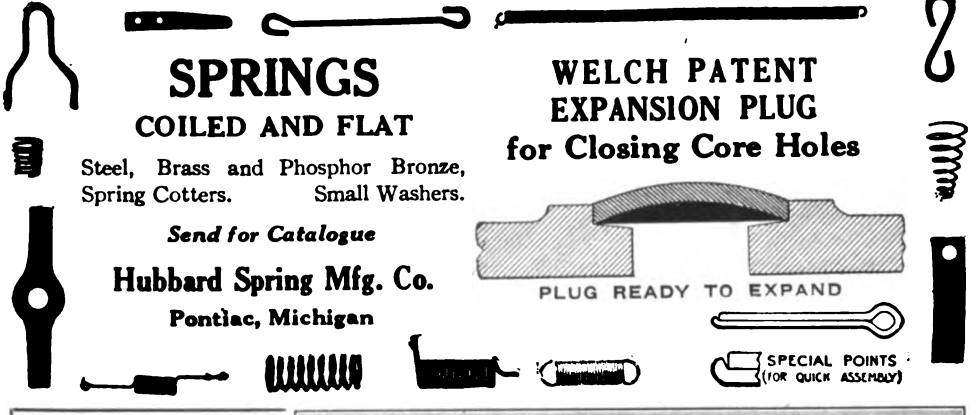

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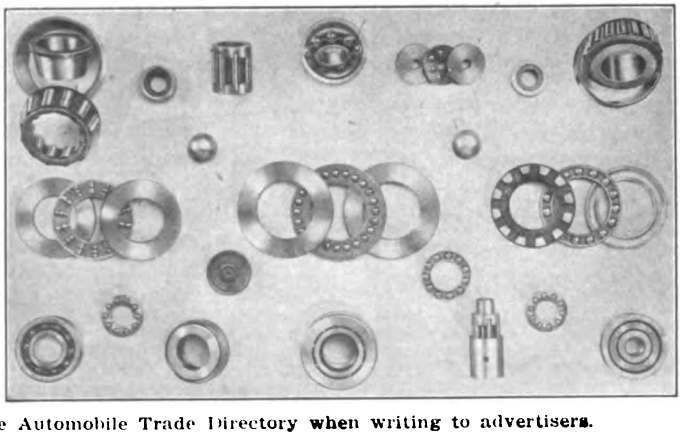

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CUTTERS (Continued)

PIPE CUTTERS

(Hand Power)

ARMSTRONG Mfg. Co., Bridgeport, Conn.

AYES & Co., Chicago, Ill. "Barnes," "Saunders."

BARNES—See Ayes & Co.

BARNES—See Collmer Bros.

BARNES Tool Co., New Haven, Conn.

COLLMER Bros., South Bend, Ind. "Barnes," "Saunders."

ERIE Tool Works, Erie, Pa.

HOLLANDS Mfg. Co., Erie, Pa.

MARK Mfg. Co., Chicago, Ill.

OSWEGO Tool Co., Oswego, N. Y.

REED Mfg. Co., Erie, Pa.

SAUNDERS—See Ayes & Co.

SAUNDERS—See Collmer Bros.

SAUNDERS Sons, D., Yonkers, N. Y.

TRIMO—See Trimont Mfg. Co.

TRIMONT Mfg. Co., 55 Amory St., Roxbury, Mass. "Trimo."
(See page 775.)

WELLS & Son Co., F. E., Greenfield, Mass.

ROD AND BAR CUTTERS

(Hand Power)

ARMSTRONG-BLUM Mfg. Co., Chicago, Ill. "Marvel."

BELDEN Machine Co., New Haven, Conn.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

MARVEL—See Armstrong-Blum Mfg. Co.

MERWIN Mfg. Co., Erie, Pa. "Vulcan."

SCHATZ Mfg. Co., Poughkeepsie, N. Y.

TUCKER, W. H. & C. F., Hartford, Conn.
(See page 193.)

VULCAN—See Merwin Mfg. Co.

WALLACE Supplies Mfg. Co., Chicago, Ill.

SPRUE CUTTERS

BARNETT Foundry Co., Oscar, Irvington, N. J.

BLISS Co., E. W., Brooklyn, N. Y.

BRASS Founders Supply Co., Newark, N. J.

STANDARD Machinery Co., Auburn, R. I.
(See page 713.)

TESSMER Machine & Tool Co., Detroit, Mich.

TOLEDO Machine & Tool Co., Toledo, O.

TURNER Machine Co., Philadelphia, Pa.

WASHER OR GASKET CUTTERS

BONNEY Vise & Tool Works, Allentown, Pa. "Cooper."

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

CINCINNATI Tool Co., Norwood, O. "Hargrave."

COOPER—See Bonney Vise & Tool Works.

GOODELL-PRATT Co., Greenfield, Mass.

HARGRAVE—See Cincinnati Tool Co.

HOGGSON & Pettis Mfg. Co., New Haven, Conn.

JOHNSON, Wm., Newark, N. J.

KRAEUTER & Co., Newark, N. J.

LOWENTRAUT Mfg. Co., P., Newark, N. J

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo.
(See page 747.)

SHAWVER Co., Springfield, O.

SMITH, Otis A., Rockfall, Conn.

STORTZ & Son, John, Philadelphia, Pa.

WIDNEY & Widney, Chicago, Ill.

WOOD FORMING CUTTERS

SHIMER & Sons, Samuel J., Milton, Pa.

DIES

SCREW CUTTING DIES

(See Taps and Dies)

DIVIDERS

DIVIDERS AND CALIPERS

(See Calipers and Dividers)

DOGS

LATHE DOGS

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill.
(See page 707.)

BESLY & Co., Charles H., Chicago, Ill.

BILLINGS & Spencer Co., Hartford, Conn.

BONNEY Vise & Tool Works, Allentown, Pa. "Indispensable."

COLLMER Bros., South Bend, Ind. "Le Count."

INDISPENSABLE—See Bonney Vise & Tool Works.

LE COUNT—See Collmer Bros.

LE COUNT, Wm. G., South Norwalk, Conn.

LUTZ-WEBSTER Engineering Co., Philadelphia, Pa.

MARK Mfg. Co., Chicago, Ill.

NATIONAL—See Oneida National Chuck Co.

O. K. Tool Holder Co., Shelton, Conn.

ONEIDA National Chuck Co., Oneida, N. Y. "National."

OSWEGO Tool Co., Oswego, N. Y.

PHOENIX Hardware Co., Buffalo, N. Y.

READY Tool Co., Bridgeport, Conn. "Red-E."

RED-E—See Ready Tool Co.

UNION Caliper Co., Orange, Mass.

UNION Elevator & Machine Co., Chicago, Ill.

VULCAN—See Williams & Co.

WEST Steel Casting Co., Cleveland, O.

WILLIAMS & Co., J. H., Brooklyn, N. Y. "Vulcan."

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Piston Ring

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"NO-LEAK-O" not only has a good tight joint, but a groove full of oil all around the ring insuring the best seal as well as perfect lubrication without waste. Write for folder and special trial offer.

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BUTLER, A. G., New York, N. Y.

CLEVELAND Galvanizing Works Co., Cleveland, O.

DIAMOND Clamp & Flask Co., Richmond, Ind

EVERETT & Son, A., Auburn, N. Y.

KNIGHT & Son, H. W., Seneca Falls, N. Y.

MORSE, Frank W., 293 Congress St., Boston, Mass.
(See page 517.)

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa.
(See page 725.)

PERFECT—See Benskin Mfg. Co.

TIMMIS & Clissold, Bound Brook, N. J.

WELLMAN Pattern-Supply Co., Cleveland, O.

WINKLEY Co., Detroit, Mich.
(See page 203.)

DRESSERS

EMERY WHEEL DRESSERS

BALDWIN, Tuthill & Bolton, Grand Rapids, Mich.

BANDLER & Sons, Bernard, New York, N. Y.

BAY State Stamping Co., Worcester, Mass. "Bennett."

BENNETT—See Bay State Stamping Co.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

CALDER, Geo. H., Lancaster, Pa.

CHICAGO Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. "Huntington."
(See pages 287 and 443.)

CLIZBE Bros. Mfg. Co., Plymouth, Ind. "Crown."

COLLMER Bros., South Bend, Ind. "Huntington."

CRAFTS, Arthur A., Boston, Mass.

CROWN—See Clizbe Bros. Mfg. Co.

DESMOND-STEPHAN Mfg. Co., Urbana, O. "Diamo-Carbo," "Sherman," "Huntington."

DETROIT Screw Works, Detroit, Mich. "Huntington."
(See page 849.)

DIAMO-CARBO—See Desmond-Stephan Mfg Co.

DIAMOND Saw & Stamping Works, Buffalo, N. Y. "Sterling."

DIAMOND Tool Co., Chicago, Ill.

DIAMOND Tool & Die Co., Hartford, Conn.

ERIE Tool Works, Erie, Pa.

HUNTINGTON—See Chicago Screw Co.

HUNTINGTON—See Collmer Bros.

HUNTINGTON—See Desmond-Stephan Mfg. Co.

HUNTINGTON—See Detroit Screw Works.

HUNTINGTON—See Mark Mfg. Co.

MARK Mfg. Co., Chicago, Ill. "Huntington."

NORTH Wales Machine Co., North Wales, Pa.

OSGOOD, J. L., Buffalo, N. Y.

PENINSULA Emery Wheel Co., Detroit, Mich.

QUADRIGA Mfg. Co., Chicago, Ill. "Rearwin."

REARWIN—See Quadriga Mfg. Co.

REED Mfg. Co., Erie, Pa.

SHERMAN—See Desmond-Stephan Mfg. Co.

STANDARD Tool Co., Cleveland, O.

STERLING—See Diamond Saw & Stamping Works.

STERLING Grinding Wheel Co., Tiffin, O.

STRICKLAND, E. M., Detroit, Mich.

TANITE Co., Stroudsburg, Pa.

VINCENT Steel Process Co., Detroit, Mich.

WARREN Axe & Tool Co., Warren, Pa.

WESTERN Tool & Mfg. Co., Springfield, O.

WRIGLEY Co., Thomas, Chicago, Ill.

DRILLS

BREAST DRILLS

FRAY Co., John S., Bridgeport, Conn.

GOODELL-PRATT Co., Greenfield, Mass.

MALLEABLE Iron Fittings Co., Branford, Conn. "Mifco."

MIFCO—See Malleable Iron Fittings Co.

MILLERS Falls Co., Millers Falls, Mass.

NORTH Bros. Mfg. Co., Philadelphia, Pa. "Yankee."

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

TURNER & Deegan, Bristol, Conn.

YANKEE—See North Bros. Mfg. Co.

CENTERING DRILLS

CLEVELAND Twist Drill Co., Cleveland, O.

SLOCOMB Co., J. T., Providence, R. I.

PNEUMATIC DRILLS

(See Tools, Pneumatic)

ELECTRIC PORTABLE DRILLS, GRINDERS AND POLISHERS

AMERICAN Electric Tool Co., West Newton, Mass. "Carver."

BLACK & Decker Mfg. Co., 105 S. Calvert St., Baltimore, Md.
(See page 737.)

CARVER—See American Electric Tool Co.

CHICAGO Pneumatic Tool Co., Chicago, Ill. "Duntley."

CINCINNATI Electrical Tool Co., Cincinnati, O.

Complete Index to Classification appears on Pages 8 to 27.

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¼" drill, weight 9 pounds.

⅜" drill, weight 14 pounds

½" drill in steel, weight 24 pounds

Made in three sizes, one-horse, two and three-horse.

High-speed internal grinder, speed 18,000 for use on a lathe.

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DRILLS (Continued)

ELECTRIC PORTABLE DRILLS, GRINDERS AND POLISHERS (Continued)

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COATES Clipper Mfg. Co., Worcester, Mass

CRANE, H. G., Brookline, Mass.

DEER Co., A. J., Hornell, N. Y. "Royal."

DUMORE—See Wisconsin Electric Co.

DUNTLEY—See Chicago Pneumatic Tool Co.

GEM Mfg. Co., Pittsburg, Pa.

HISEY-WOLF Machine Co., Cincinnati, O.

IDEAL—See Neil & Smith Electric Tool Co.

NEIL & Smith Electric Tool Co., Cincinnati, O. "Ideal."

PLANK Flexible Shaft Machine Co., Grand Rapids, Mich.

RACINE Electric Co., Racine, Wis.

ROYAL—See Deer Co.

STANDARD Electric Tool Co., Cincinnati, O.

STOW Flexible Shaft Co., Philadelphia, Pa.

STOW Mfg. Co., Binghamton, N. Y.

TEMCO Electric Motor Co., Leipsic, O. (See pages 448 and 449.)

UNITED States Electrical Tool Co., Cincinnati, O. (See page 683.)

VAN Dorn Electric Tool Co., Cleveland, O.

WILLEY—See Clark, Jr., Electric Co.

WISCONSIN Electric Co., Racine, Wis. "Dumore."

MULTIPLE SPINDLE DRILLING MACHINES

BAUSH Machine Tool Co., Springfield, Mass.

FOOTE-BURT Co., Cleveland, O.

FOX Machine Co., Grand Rapids, Mich.

HOLE HOG—See Moline Tool Co.

LANGELIER Mfg. Co., Providence, R. I.

MOLINE Tool Co., Moline, Ill. "Hole Hog."

NATCO—See National Automatic Tool Co.

NATIONAL Automatic Tool Co., Richmond, Ind. "Natco."

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

SCALLAN & Co., W. E., Cincinnati, O.

POST DRILLING MACHINES

ADVANCE—See Silver Mfg. Co.

AMERICAN Foundry & Mfg. Co., St. Louis, Mo.

BAUSH Machine Tool Co., Springfield, Mass.

BOYNTON & Plummer, Chester Depot, Vt.

BUFFALO Forge Co., Buffalo, N. Y.

CANEDY-OTTO Mfg. Co., Chicago Heights, Ill. "Western Chief."

CHAMPION Blower & Forge Co., Lancaster, Pa.

ILLINOIS Iron & Bolt Co., Carpentersville, Ill

LITTLE GIANT—See Noyes & Co.

NOYES & Co., B. B., Greenfield, Mass. "Little Giant."

SILVER Mfg. Co., Salem, O. "Advance."

WESTERN CHIEF—See Canedy-Otto Mfg. Co.

RADIAL DRILLING MACHINES

AMERICAN Tool Works Co., Cincinnati, O.

BAUSH Machine Tool Co., Springfield, Mass.

CARLTON Machine Tool Co., Cincinnati, O.

CINCINNATI-BICKFORD Tool Co., Cincinnati, O.

DRESES Machine Tool Co., Cincinnati, O.

FOSDICK Machine Tool Co., Cincinnati, O.

HILBERT Machine Co., Cincinnati, O.

MORRIS Machine Tool Co., John B., Cincinnati, O.

MUELLER Machine Tool Co., Cincinnati, O.

NILES-BEMENT-POND CO., New York, N. Y

REED-PRENTICE Co., Worcester, Mass.

TAYLOR & Fenn Co., Hartford, Conn.

WESTERN Machine Tool Works, Holland, Mich.

RATCHET DRILLS

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)

ATHA Tool Co., Newark, N. J.

BILLINGS & Spencer Co., Hartford, Conn. "Packer."

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

DIAMOND—See Whitman & Barnes Mfg. Co.

GOODELL-PRATT Co., Greenfield, Mass.

HUNTER Machine Co., Jas., North Adams, Mass.

KEYSTONE Mfg. Co., Buffalo, N. Y. "Monarch," "Weston."

LOWELL Wrench Co., Worcester, Mass.

MILLERS Falls Co., Millers Falls, Mass.

MONARCH—See Keystone Mfg. Co.

OHLEN & Sons Saw Mfg. Co., James, Columbus, O.

OSWEGO Tool Co., Oswego, N. Y. "Packer."

PACKER—See Billings & Spencer Co.

PACKER—See Oswego Tool Co.

PARKER Co., Charles, Meriden, Conn.

PECK, Stow & Wilcox Co., Southington, Conn "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PRATT & Whitney Co., Hartford, Conn "Renshaw." (See page 661.)

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IN addition to VITALIC Auto Tires and Tubes, we make a most complete and highly specialized line of automobile accessories. The VITALIC trademark insures only goods of recognized merit and established high quality.

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Patent applied for

When placed inside of the tire, and the tire properly inflated, the liner **will stay just where it is put** and cannot slip. The Kant Slip Inner Liner is also a complete inside fabric reinforcement, extending the full length of the tire from bead to bead.

Notice the Flap that Prevents Slipping

Inner Liner can be reused after old casing has been discarded, wearing twice as long as any other.

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The Quality suits the Fastidious — **The Price suits Everyone**

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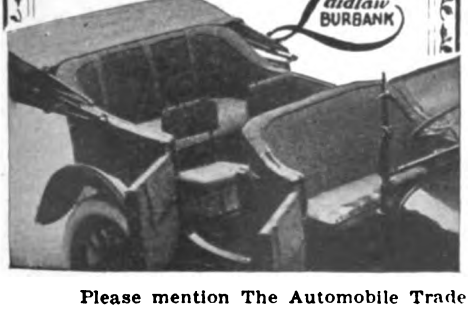

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PRODUCTS

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DRILLS (Continued)

RATCHET DRILLS (Continued)

RENSHAW—See Pratt & Whitney Co.

WESTON—See Keystone Mfg. Co.

WHITMAN & Barnes Mfg. Co., Akron, O. "Diamond."

SENSITIVE DRILLING MACHINES

AVEY—See Cincinnati Pulley Machinery Co.

BURKE Machine Tool Co., Conneaut, O.

CINCINNATI Pulley Machinery Co., Cincinnati, O. "Avey."

CONOVER-OVERKAMP Machine & Tool Co., Dayton, O.

CORBIN-CHURCH Co., New Britain, Conn.

ECONOMY—See Rockford Lathe & Drill Co.

FOX Machine Co., Grand Rapids, Mich.

HENRY & Wright Mfg. Co., Hartford, Conn.

HOYSRADT & Case, Kingston, N. Y.

KERN Machine Tool Co., Hamilton, O.

LANGELIER Mfg. Co., Providence, R. I.

LELAND-GIFFORD Co., Worcester, Mass.

MYERS Machine Tool Co., Columbia, Pa.

NORTH Wales Machine Co., North Wales, Pa.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

REED Co., Francis, Worcester, Mass.

REED-PRENTICE Co., Worcester, Mass.

ROCKFORD Lathe & Drill Co., Rockford, Ill. "Economy."

ROCKWELL—See Ryerson & Son.

RYERSON & Son, Joseph T., Chicago, Ill. "Rockwell."

SIPP Machine Co., Paterson, N. J.

SLOAN & Chace Mfg. Co., Newark, N. J.

STAPF & Co., John B., Dunkirk, N. Y.

TAYLOR & Fenn Co., Hartford, Conn.

WASHBURN Shops, Worcester, Mass.

TURRET DRILLING MACHINES

QUINT, A. D., Hartford, Conn.

TURNER Machine Co., Danbury, Conn

TWIST DRILLS

BUCKEYE Twist Drill Co., Alliance, O.

CELFOR Tool Co., Buchanan, Mich.

CLEVELAND Twist Drill Co., Cleveland, O. "Paragon."

DETROIT Twist Drill Co., Detroit, Mich. (See page 687.)

DIAMOND—See Whitman & Barnes Mfg. Co.

LINCOLN-WILLIAMS Twist Drill Co., Taunton, Mass.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL Twist Drill & Tool Co., Detroit, Mich.

NEW Process Twist Drill Co., Taunton, Mass.

NORKA—See Whitman & Barnes Mfg. Co.

PARAGON—See Cleveland Twist Drill Co.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

RICH Tool Co., Chicago, Ill.

STANDARD Tool Co., Cleveland, O.

SYRACUSE Twist Drill Co., Syracuse, N. Y.

UNION Twist Drill Co., Athol, Mass.

WHITAKER Mfg. Co., Chicago, Ill. (See page 765.)

WHITMAN & Barnes Mfg. Co., Akron, O. "Norka," "Diamond."

UPRIGHT DRILLING MACHINES

AURORA Tool Works, Aurora, Ind.

BAKER Bros., Toledo, O.

BARNES Co., W. F. & John, Rockford, Ill.

BARNES Drill Co., Rockford, Ill.

BARR, H. G., Worcester, Mass.

CINCINNATI-BICKFORD Tool Co., Cincinnati, O.

COLBURN Machine Tool Co., Franklin, Pa.

DAVIS Machine Tool Co., Rochester, N. Y.

ECONOMY—See Rockford Lathe & Drill Co.

FRONTIER Iron Works, Buffalo, N. Y.

HILBERT Machine Co., Cincinnati, O.

HOEFER Mfg. Co., Freeport, Ill.

KERN Machine Tool Co., Hamilton, O.

KOKOMO—See Superior Machine Tool Co.

NILES-BEMENT-POND Co., New York, N. Y.

REED-PRENTICE Co., Worcester, Mass.

ROCKFORD Drilling Machine Co., Rockford, Ill.

ROCKFORD Lathe & Drill Co., Rockford, Ill. "Economy."

ROCKFORD Machine Tool Co., Rockford, Ill.

SIBLEY Machine Co., South Bend, Ind.

SNYDER & Son, J. E., Worcester, Mass.

SUPERIOR Machine Tool Co., Kokomo, Ind. "Kokomo."

TAYLOR & Fenn Co., Hartford, Conn.

TSCHUDI-McBARRON Machine Co., Dayton.

DRIVERS

SCREW DRIVERS

AMERICAN Forge & Machine Co., Canton, O.

AUTO Forge Sales Co., Columbus, O.

BILLINGS & Spencer Co., Hartford, Conn.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J. "New Century," "O. K.," "Ideal."

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Refinements of comfort and convenience in motor cars are prime essentials nowadays, second only to mechanical efficiency.

The Dura Window Lifter adjusts the window to *any position*, by simply moving a lever—no more trouble or effort than moving the spark or throttle levers on the steering wheel.

It is regular equipment on the closed cars and limousines sold by Overland, National, Hupmobile, Scripps-Booth, Milburn Light Electric, Ohio Electric, Baker, Rauch & Lang Electric and others.

The Dura Window Lifter is convenient and easy to operate.

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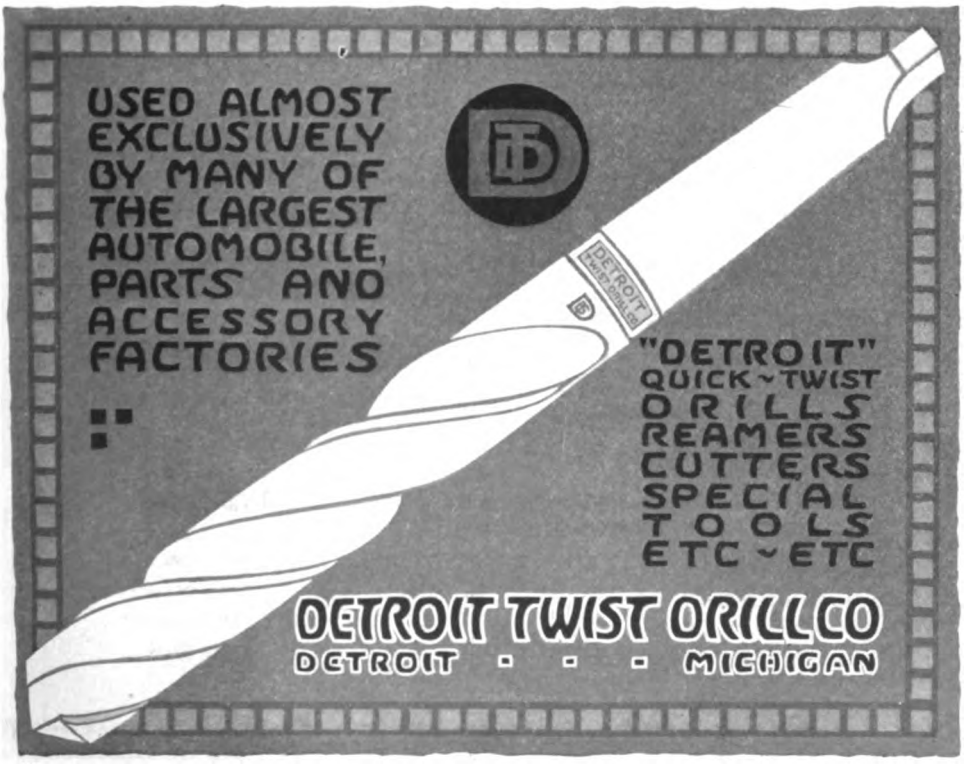
3138 Monroe Street **Toledo, Ohio**



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DRIVERS (Continued)

SCREW DRIVERS (Continued)

BRIDGEPORT Hardware Mfg. Corp., Bridgeport, Conn. "Warwick," "Hercules," "Lead-All," "Matchless," "Reliance," "Vulcan."

BUFFUM Tool Co., Louisiana, Mo.

CASSADY-FAIRBANK Mfg. Co., Chicago, Ill.

CHAMPION—See Union Hardware Co.

CHAPIN-STEPHENS Co., Pine Meadow, Conn.

CINCINNATI Tool Co., Norwood, O. "Hargrave."

CRESCENT Tool Co., Jamestown, N. Y. "Hamr-Handl."

CRONK & Carrier Mfg. Co., Elmira, N. Y. "Elmira," "Star."

DICKE Tool Co., Downers Grove, Ill.

DIKEMAN Mfg. Co., Norwalk, Conn.

DISSTON Sons, Henry, Philadelphia, Pa.

ELMIRA—See Cronk & Carrier Mfg. Co.

ERIE Stamping & Mfg. Co., Erie, Pa. "Esco."

ESCO—See Erie Stamping & Mfg. Co.

GAY, Geo. E., Augusta, Me.

GIANT—See Tuck Mfg. Co.

GOODELL-PRATT Co., Greenfield, Mass.

HAMR-HANDL—See Crescent Tool Co.

HARGRAVE—See Cincinnati Tool Co.

HERBRAND Co., Fremont, O.
(See page 679.)

HERCULES—See Tuck Mfg. Co.

HERCULES—See Bridgeport Hardware Mfg. Corp.

HURWOOD—See Stanley Rule & Level Co.

IDEAL—See Braunsdorf-Mueller Co.

IVES Mfg. Co., W. A., Wallingford, Conn. "Mephisto."

JOHNSON, Wm., Newark, N. J.

LEAD-ALL—See Bridgeport Hardware Mfg. Corp.

LIPSCOMB—See Ellis Co.

MARBLE Arms & Mfg. Co., Gladstone, Mich.

MARCY Tool Works, Putnam, Conn.

MATCHLESS—See Bridgeport Hardware Mfg. Corp.

MAYHEW Co., H. H., Shelburne Falls, Mass. "Monarch," "Peerless."

MEPHISTO—See Ives Mfg. Co.

MONARCH—See Mayhew Co.

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo.
(See page 747.)

NEVER BREAK—See S. & I. Co.

NEW CENTURY—See Braunsdorf-Mueller Co.

NORTH Bros. Mfg. Co., Philadelphia, Pa. "Yankee."

O. K.—See Braunsdorf-Mueller Co.

OHIO Tool Co., Charleston, W. Va.

PEERLESS—See Mayhew Co.

PERFECT HANDLE—See Smith & Co.

RELIABLE—See S. & I. Co.

RELIANCE—See Bridgeport Hardware Mfg. Corp.

RIVAL—See S. & I. Co.

S. & I. Co., Springfield, Mass. "Never Break," "Reliable," "Rival."

SMITH & Co., H. D., Plantsville, Conn. "Perfect Handle."

SNELL Mfg. Co., Fishdale, Mass.

STANLEY Rule & Level Co., New Britain, Conn. "Hurwood."

STAR—See Cronk & Carrier Mfg. Co.

STARRETT Co., L. S., Athol, Mass.

STORTZ & Son, John, Philadelphia, Pa.

SWAN Co., Jas., Seymour, Conn.

SYRACUSE Twist Drill Co., Syracuse, N. Y.

TUCK Mfg. Co., Brockton, Mass. "Hercules," "Giant."

TURNER & Deegan, Bristol, Conn.

UNION Hardware Co., Torrington, Conn. "Champion," "Valley."

VALLEY—See Union Hardware Co.

VLCHEK Tool Co., Cleveland, O.

VULCAN—See Bridgeport Hardware Mfg. Corp.

WARWICK—See Bridgeport Hardware Mfg. Corp.

YANKEE—See North Bros. Mfg. Co.

DRYERS

SAND DRYERS

PANGBORN Corp., Hagerstown, Md.

ZELNICKER Supply Co., Walter A., St. Louis, Mo.

ELEVATORS

GARAGE ELEVATORS

BRODESSER Mfg. Co., Milwaukee, Wis.

COHOES Iron Foundry & Machine Co., Cohoes, N. Y.

EATON & Prince Co., Chicago, Ill.

HAUGHTON Elevator & Machine Co., Toledo, O.

KIECKHEFER Elevator Co., A., Milwaukee, Wis.

McLAUTHLIN Co., Geo. T., Boston, Mass.

OTIS Elevator Co., New York, N. Y.

REEDY Co., H. J., Cincinnati, O.

REEDY Elevator Co., Hoboken, N. J.

REEDY Elevator Mfg. Co., J. W., Chicago, Ill.

SEDGWICK Machine Works, New York, N. Y.

SIDNEY Elevator Mfg. Co., Sidney, O.

SPEIDEL, J. G., Reading, Pa.
(See page 689.)

STORM Mfg. Co., Newark, N. J.

WARNER Elevator Mfg. Co., Cincinnati, O.

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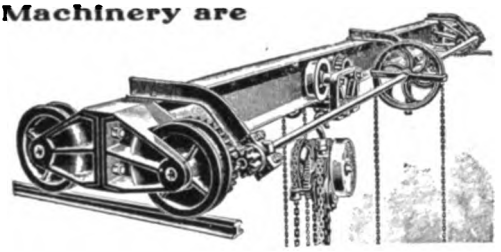

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AJAX Mfg. Co., Pittsburg (N. S.), Pa.

FORG, Peter, Somerville, Mass.

EXTINGUISHERS

FIRE EXTINGUISHERS

ACCURATE—See National Metal Stamping & Mfg. Co.

ACME—See Rex-Harris Fire Appliance Co. of N. Y.

BADGER Chemical Mfg. Co., Milwaukee, Wis. "Mitchell," "Wisconsin."

BARGAR Mfg. Co., Columbus, O.

BENTON—See Chemi Co.

BADGER & Sons Co., E. B., Boston, Mass.

BOYD & Bro., James, Philadelphia, Pa. "Keystone," "Paragon."

CHEMI Co., Richmond, Va. "Benton," "Jupiter."

CHILDS Co., O. J., Utica, N. Y. "Utica."

CHOKE-FIRE—See National Metal Stamping & Mfg. Co.

ECLIPSE—See Haverhill Fire Appliance Co.

ESCO—See Emmons Specialty Co.

FIRE-FLY—See Northwestern Chemical Co.

FRY-FYTER Co., Dayton, O.

FYRICIDE Mfg. Co., New York, N. Y. "Kilfyre."

GAMMETER-BRODBECK Sales Co., Akron, O.

HANSEN-NIETER Safety Co., New York, N. Y.

HAVERHILL Fire Appliance Co., Haverhill, Mass. "Eclipse."

J-M—See Johns-Manville Co.

J-M SUCCESS—See Johns-Manville Co.

JOHNS-MANVILLE Co., H. W., New York, N. Y. "Manville," "J-M Success," "J-M."

JOLIET—See Wilcox Co.

JUPITER—See Chemi Co.

JUSTRITE Mfg. Co., Chicago, Ill.

KEYSTONE—See Boyd & Bro.

KILFYRE—See Fyricide Mfg. Co.

LA MAY Mfg. Co., Rochester, N. Y.

LAZARUS Mfg. Co., Cleveland, O. "Lazco."

LAZCO—See Lazarus Mfg. Co.

MANVILLE—See Johns-Manville Co.

MARTEN—See National Metal Stamping & Mfg. Co.

MINIMAX Co., New York, N. Y.

MITCHELL—See Badger Chemical Mfg. Co.

NATIONAL Metal Stamping & Mfg. Co., Newark, N. J. "Accurate," "Marten," "Peerless," "Choke-Fire," "Newark."

NEVERMYSS Fire Extinguisher Co., Middletown, N. Y.

NEWARK—See National Metal Stamping & Mfg. Co.

NORTHWESTERN Chemical Co., Marietta, O. "Fire-Fly."
(See pages 172 and 173.)

PARAGON—See Boyd & Bro.

PEERLESS—See National Metal Stamping & Mfg. Co.

PILABRASGO—See Pittsburgh Lamp, Brass & Glass Co.

PITTSBURGH Lamp, Brass & Glass Co., Pittsburgh, Pa. "Pilabrasgo."

PROSPECT Mfg. Co., Prospect, O.

PYRENE Mfg. Co., New York, N. Y.

REGINA—See Rex-Harris Fire Appliance Co. of N. Y.

REX-HARRIS Fire Appliance Co. of N. Y., New York, N. Y. "Regina," "Acme," "Victor."

STEMPEL Fire Extinguisher Co., St. Louis, Mo.

U. S.—See United Mfg. Co.

UNITED Mfg. Co., Toledo, O. "U. S."

UTICA—See Childs Co.

VICTOR—See Rex-Harris Fire Appliance Co. of N. Y.

WILCOX Co., Chas. C., Enid, Okla. "Joliet."

WISCONSIN—See Badger Chemical Mfg. Co.

EXTRACTORS

BROKEN TAP EXTRACTORS

WALTON Co., Hartford, Conn.

FACINGS

FOUNDRY FACINGS AND PARTINGS

ASBURY Graphite Mills, Asbury, N. J.

CENTRAL Foundry Supply Co., Columbus, O.

DIXON Crucible Co., Joseph, Jersey City, N. J.
(See page 253.)

DOGGETT, Stanley, New York, N. Y.

FOUNDRY Specialty Co., Cincinnati, O. "Partine."

HILL & Griffith Co., Cincinnati, O.

KELLY & Co., T. P., Hamilton, O.

McCORMICK Co., J. S., Pittsburg, Pa.

OBERMAYER Co., S., Cincinnati, O.

PARTINE—See Foundry Specialty Co.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa.
(See page 725.)

PETTINOS Bros., Bethlehem, Pa.

SPRINGFIELD Facing Co., Springfield, Mass.
(See page 691.)

STEVENS, Frederic B., Detroit, Mich.
(See pages 759 and 760.)

UNITED STATES Graphite Co., Saginaw, Mich.

ZELNICKER Supply Co., Walter A., St. Louis, Mo.

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BLAKES—See Greene, Tweed & Co.

CRESCENT Belt Fastener Co., New York, N. Y.

GREENE, Tweed & Co., New York, N. Y. "Blakes," "Morans."

JENCKES Mfg. Co., E., Worcester, Mass.

MORANS—See Greene, Tweed & Co.

QUADRIGA Mfg. Co., Chicago, Ill.

SMITH & Co., F. P., Sharon Hill, Pa. "Smithicks."

SMITHICKS—See Smith & Co.

FILES

FILES AND RASPS

AKRON File Co., Akron, O.

AMERICAN—See Nicholson File Co.

AMERICAN Swiss File & Tool Co., New York, N. Y.

ARCADE—See Nicholson File Co.

BARNETT Co., C. & H., Philadelphia, Pa. "Black Diamond."

BETTER-CUT—See Racine File Co.

BLACK DIAMOND—See Barnett Co.

CHATTERTON File Works, Providence, R. I.

CHELSEA File Works, Norwich, Conn.

COLONIAL File Co., Neponset, Mass. "Puritan."

DELTA File Works, Philadelphia, Pa.

DISSTON & Sons, H., Philadelphia, Pa.

EAGLE—See Nicholson File Co.

GEM City File Works Co., Quincy, Ill.

GOLD MEDAL—See Liveright Bros.

GRAVES File Co., Newark, N. J.

GREAT WESTERN—See Nicholson File Co.

GROBET—See Montgomery & Co.

HAYES File Co., Detroit, Mich.

HELLER Bros. Co., Newark, N. J.

J. B. SMITH—See Nicholson File Co.

JOHNSON & Bro., Newark, N. J. "Reliance."

KEARNEY & FOOT—See Nicholson File Co.

LIVERIGHT Bros., Philadelphia, Pa. "Gold Medal."

McCAFFREY File Co., Philadelphia, Pa.

McCLELLAN—See Nicholson File Co.

MADDEN & Morrison File Co., Middletown, N. Y.

MONTGOMERY & Co., 105-07 Fulton St., New York, N. Y. (Importers.) "Grobet." (See page 705.)

MURCOTT & Campbell, Brooklyn, N. Y.

NICHOLSON File Co., Providence, R. I. "American," "Arcade," "Eagle," "XF," "McClellan," "Kearney & Foot," "J. B. Smith," "Great Western." (See page 693.)

PURITAN—See Colonial File Co.

RACINE File Co., Racine, Wis. "Better-cut."

RELIANCE—See Johnson & Bro.

REX File & Saw Co., New Comerstown, O.

REYNOLDS Bros., Columbus, O.

SIMONDS Mfg. Co., Fitchburg, Mass.

STANDARD Roller Bearing Co., Philadelphia, Pa. "Vixen."

TACONY File & Hardware Co. (Tacony), Philadelphia, Pa.

TROJAN—See Troy File Works.

TROY File Works, Troy, N. Y. "Trojan."

VIXEN—See Standard Roller Bearing Co.

WESTPHAL File Co., Milwaukee, Wis.

WHITAKER Mfg. Co., Chicago, Ill. (See page 765.)

XF—See Nicholson File Co.

FILLETS

WOOD AND LEATHER FILLETS

BENSKIN Mfg. Co., Canton, O. "Perfect."

BUTLER, A. G., New York, N. Y.

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EVERETT & Son, A., Auburn, N. Y.

KNIGHT & Son, H. W., Seneca Falls, N. Y.

PAGE Belting Co., Concord, N. H.

PERFECT—See Benskin Mfg. Co.

TIMMIS & Clissold, Bound Brook, N. J.

WELLMAN Pattern-Supply Co., Cleveland, O.

FLASKS

FOUNDRY FLASKS

ADAMS Co., Dubuque, Ia.

BALDWIN, Tuthill & Bolton, Grand Rapids, Mich.

BARNETT Foundry Co., Oscar, Irvington, N. J.

BRASS Foundries Supply Co., Newark, N. J.

BUCH Foundry Equipment Co., Bridgeport, Pa.

DIAMOND Clamp & Flask Co., Richmond, Ind.

EUREKA—See Smith & Caffrey Co.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. (See page 725.)

SMITH & Caffrey Co., Syracuse, N. Y. "Eureka."

STERLING Wheelbarrow Co., Milwaukee, Wis.

FLUX

BRAZING FLUX

(See Compounds, Brazing)

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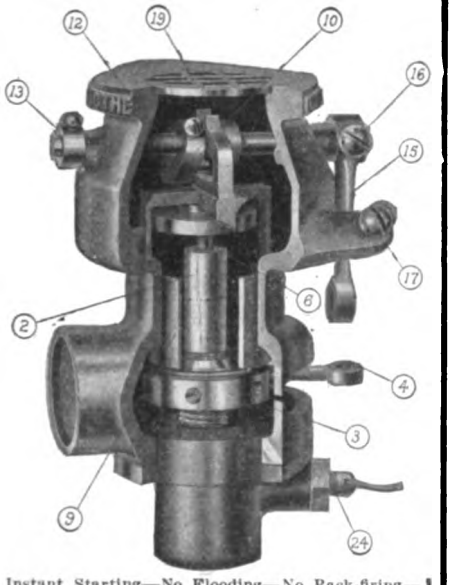
Heath Carbureter



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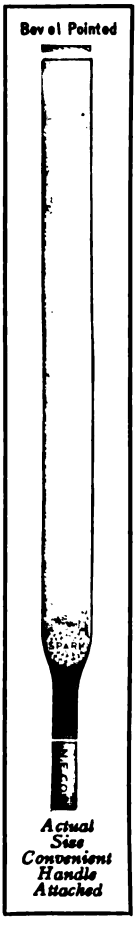

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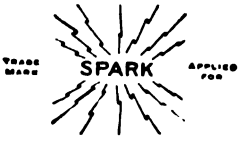

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ALUMALUX Co., Sidney, O. "Rajah."

BARCY-NICHOLSON Co., Detroit, Mich.

BENSON Co., Alex. R., Hudson, N. Y. "Yagers."

BLAKE Signal & Mfg. Co., Boston, Mass.

BRUNNER Chemical Works, Cincinnati, O. "Queen."

BURNLEY Battery & Mfg. Co., North East, Pa.

CALLAHAN & Co., Geo., New York, N. Y.

CORLISS Supply Co., St. Louis, Mo.

CRESCENT—See McGill Mfg. Co.

DIELECTRIC Mfg. Co., St. Louis, Mo.

DUNTON Co., M. W., Providence, R. I. "Nokorode."

ECHO Motor Co., Tonawanda, N. Y.

ELLIOTT Chemical Works, Newton, Mass.

EMENAR Co., New York, N. Y. "Solderall."

EUREKA—See Grasselli Chemical Co.

GRASSELLI Chemical Co., New York, N. Y. "Standard," "Eureka."

HALL-THOMPSON Co., Hartford, Conn. "Wonder Worker."
(See page 171.)

HESS & Son, Philadelphia, Pa. "Tinol."

ILLINOIS Smelting & Refining Co., Chicago, Ill. "Peerless."

INCOMPARABLE—See Reade Mfg. Co.

KALBFLEISCH Co., Franklin H., Broadway & 16th St., New York, N. Y.
(See page 681.)

KREMBS & Co., Chicago, Ill.

McGILL Mfg. Co., Valparaiso, Ind. "Crescent," "Star."

MILMORE Corp., South Bend, Ind.

NOKORODE—See Dunton Co.

PEERLESS—See Illinois Smelting & Refining Co.

QUEEN—See Brunner Chemical Works.

RAJAH—See Alumalux Co.

READE Mfg. Co., Hoboken, N. J. "Incomparable," "Readina."

READINA—See Reade Mfg. Co.

RED LETTER—See Ruby Chemical Co.

REEPS Mfg. Co., New York, N. Y. "20th Century."

RUBY Chemical Co., Columbus, O. "Red Letter."

SAMPSON—See Allen Co.

SCHNEIDER, Emil, Newark, N. J.

SOLDERALL—See Emenar Co.

STANDARD—See Grasselli Chemical Co.

STAR—See McGill Mfg. Co.

SUN—See Allen Co.

TINOL—See Hess & Son.

TRIAD Co., Belmar, N. J.

20TH CENTURY—See Reeps Mfg. Co.

UNIVERSAL Fluxine Co., Urbana, O.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 643.)

WONDER WORKER—See Hall-Thompson Co.

YAGERS—See Benson Co.

WELDING FLUX

(See Compounds, Welding)

FORGES

BLACKSMITHS FORGES

BILLINGS & Spencer Co., Hartford, Conn.

BOYNTON & Plummer, Chester Depot, Vt.

BUFFALO Forge Co., Buffalo, N. Y.

CANEDY-OTTO Mfg. Co., Chicago Heights, Ill. "Royal," "Western Chief," "Challenge," "Hero," "Leader."

CHALLENGE—See Canedy-Otto Mfg. Co.

CHAMPION Blower & Forge Co., Lancaster, Pa.

HERO—See Canedy-Otto Mfg. Co.

LEADER—See Canedy-Otto Mfg. Co.

ROYAL—See Canedy-Otto Mfg. Co.

SILVER Mfg. Co., Salem, O.

STURTEVANT Co., B. F., Hyde Park, Mass.

WESTERN CHIEF—See Canedy-Otto Mfg. Co.

FRAMES

HACK SAW FRAMES

(For Hack Saw Blades—See Blades, Hack Saw)

ATKINS & Co., E. C., Indianapolis, Ind. "Hoosier," "Indiana."

BRIDGEPORT Hardware Mfg. Corp., Bridgeport, Conn.

BUFFUM Tool Co., Louisiana, Mo.

CROWN—See Union Hardware Co.

DIAMOND Saw & Stamping Works, Buffalo, N. Y. "Sterling."

DIKEMAN Mfg. Co., Norwalk, Conn.

DISSTON & Sons, Henry, Philadelphia, Pa. "Eagle," "Keystone."

EAGLE—See Disston & Sons.

EAGLE—See Union Hardware Co.

GOODELL-PRATT Co., Greenfield, Mass.

GRIFFIN Co., G. W., Franklin, N. H.

HOOSIER—See Atkins & Co.

INDIANA—See Atkins & Co.

JENNINGS & Co., C. E., New York, N. Y.

KEYSTONE—See Disston & Sons.

LANGELIER Mfg. Co., Providence, R. I.

MASSACHUSETTS Saw Works, Springfield, Mass. "Victor."

MASTER GRIP—See Thompson & Son Co.

MILFORD—See Thompson & Son Co.

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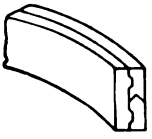

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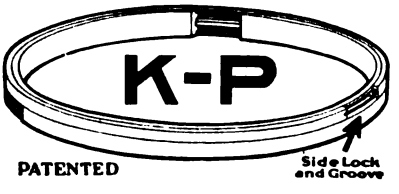
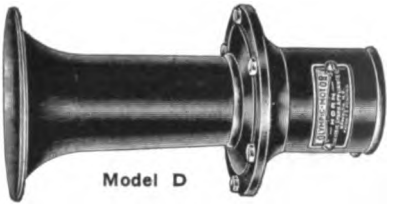


OLYMPIC HORNS



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FRAMES (Continued)

HACK SAW FRAMES (Continued)

MILLERS Falls Co., Millers Falls, Mass. "Star."

QUALITY Saw & Tool Works, Springfield, Mass.

S. & I. Co., Springfield, Mass.

SIMONDS Mfg. Co., Fitchburg, Mass.

STAR—See Millers Falls Co.

STARRETT Co., L. S., Athol, Mass.

STERLING—See Diamond Saw & Stamping Works.

THOMPSON & Son Co., Henry G., New Haven, Conn. "Milford," "Master Grip."

UNION Caliper Co., Orange, Mass.

UNION Hardware Co., Torrington, Conn. "Crown," "Eagle."

UNIVERSAL—See West Haven Mfg. Co.

UTILITY—See West Haven Mfg. Co.

VICTOR—See Massachusetts Saw Works.

WEST Haven Mfg. Co., New Haven, Conn. "Utility," "Universal."

FULLERS

FULLERS AND SWAGES

ATHA Tool Co., Newark, N. J.

BEALL Bros., Alton, Ill.

EVANSVILLE Tool Works, Evansville, Ind.

FISHER & Norris, Trenton, N. J.

HELLER Bros. Co., Newark, N. J.

KLEIN-LOGAN Co., Pittsburg, Pa.

SWETT Iron Works, A. L., Medina, N. Y.

VAUGHAN & Bushnell Mfg. Co., Chicago, Ill.

FUNNELS

GASOLINE FUNNELS

A-H Mfg. Co., Cleveland, O.

ATLANTIC Stamping Co., Rochester, N. Y.

BEST, R. L., Bismarck, N. Dak.

CENTRAL Stamping Co., New York, N. Y. "Puritan."

DOVER Stamping & Mfg. Co., Cambridge, Mass. "Saval."

ENTORP Filter Co., Amboy, Ill.

HOAGLIN Mfg. Co., F. L., Waupaca, Wis. "Nospill."

KRAFT, A. C., Chicago, Ill.

MASON Co., Geo. H., Boston, Mass.

NATIONAL Enameling & Stamping Co., New York, N. Y.

NOSPILL—See Hoaglin Mfg. Co.

PURITAN—See Central Stamping Co.

PURITAN—See Sexton Can Co.

SAVAL—See Dover Stamping & Mfg. Co.

SCHUYLER Mfg. Co., W. S., Savannah, Mo.

SEXTON Can Co., Boston, Mass. "Puritan."

VOGEL & Bros., Wm., Brooklyn, N. Y.

WEBER Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill. (See page 793.)

FURNACES

ANNEALING AND CASE HARDENING FURNACES

AMERICAN Gas Furnace Co., 24 John St., New York, N. Y. (See page 721.)

BELLEVUE Industrial Furnace Co., Detroit, Mich.

BEST, W. N., New York, N. Y.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BUCKEYE—See Macleod Co.

CHICAGO Flexible Shaft Co., Chicago, Ill. "Stewart."

GANTT—See Witteman Co.

GILBERT & Barker Mfg. Co., Springfield, Mass.

HAUCK Mfg. Co., Brooklyn, N. Y.

JOHNSON Gas Appliance Co., Cedar Rapids, Ia. (See page 697.)

MACLEOD Co., Cincinnati, O. "Buckeye."

ROCKWELL Co., W. S., New York, N. Y.

SCOTT, C. U., Davenport, Ia.

STEWART—See Chicago Flexible Shaft Co.

TATE-JONES & Co., Pittsburg, Pa.

WESTMACOTT Gas Furnace Co., Providence, R. I.

WHITING Foundry Equipment Co., Harvey, Ill.

BABBITT MELTING FURNACES

AMERICAN Gas Furnace Co., 24 John St., New York, N. Y. (See page 721.)

CHICAGO Flexible Shaft Co., Chicago, Ill. "Stewart."

DAVIS Machine Tool Co., Rochester, N. Y. "Vesuvius."

HAUCK Mfg. Co., Brooklyn, N. Y.

JOHNSON Gas Appliance Co., Cedar Rapids, Ia. (See page 697.)

STEWART—See Chicago Flexible Shaft Co.

VESUVIUS—See Davis Machine Tool Co.

WESTMACOTT Gas Furnace Co., Providence, R. I.

BRASS AND COPPER MELTING FURNACES

BARNETT Foundry Co., Oscar, Irvington, N. J.

BEST, W. N., New York, N. Y.

BRASS Founders Supply Co., Newark, N. J.

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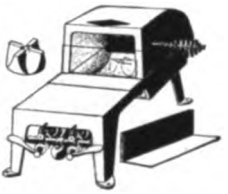
YOU NEED NEITHER POWER NOR BLOWER WITH THE

JOHNSON GAS BENCH FURNACE

FOR HIGH TEMPERATURE HEAT TREATING OF METALS



The JOHNSON NO. 101 GAS BENCH FURNACE uses either artificial or natural gas. It is equipped with two powerful auto-blast Bunsens of the famous Johnson Direct Jet Type, each producing a *flame temperature* around 2250 degrees Fahrenheit. Each burner is fitted with the Johnson Adjustable Direct Jet Regulator which is instantly adjustable to any quality or pressure of gas, insuring perfect construction and maintaining the maximum jet velocity.

Every device and convenience which practical use has developed is supplied in these furnaces; there's a removable rest block which compels an even heat at all parts of the metal; a faced baffle plate which partially closes the opening and is invaluable when heavier pieces are being treated. The rear shelf affords a rest for soldering coppers and keeps the high temperature flame from striking the points direct and every need is provided for.

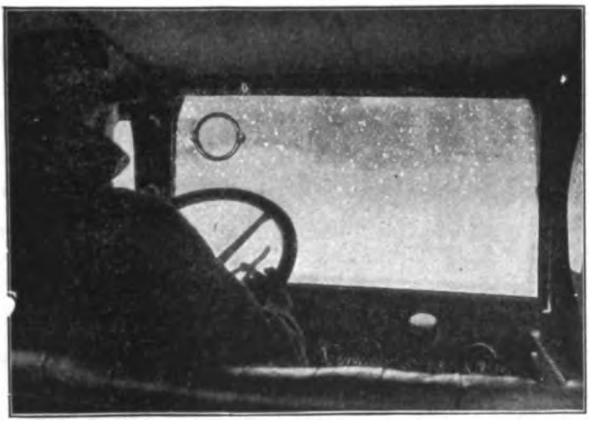
The Direct Jet Regulator

The operation is extremely simple. By turning the regulating screw the cap is moved up or down upon the Direct Jet Regulator, the segments of which are elastic, so that the orifice is adjusted to the proper size to produce a flame of maximum intensity without the use of an air blast.

FREE TRIAL OFFER

Let us ship you this 101 Furnace on 10 days' approval. We'll prepay express charges, and if it does not prove satisfactory, return it to us for credit at the end of 10 days. Order today, and see what this furnace can do.

JOHNSON GAS APPLIANCE COMPANY, CEDAR RAPIDS IOWA



Safety First!

Don't take chances in rainy, sleety or snowy weather when the view through your windshield is obscured. Don't open up the wind shield and let the cold wind, sleet and snow into the car. Use the

"CAPITOL" Wind Shield Device

and be safe, warm and comfortable. Any good glazier or windshield repair man can install the "Capitol" in a few minutes. It's light and non-breakable—keeps your wind shield free from breaks and cracks—is smart in appearance and costs only $1.50. Made in two models, to fit glass or celluloid windshields.

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selling and installing the Capitol Windshield Device. Our proposition is a broad-gauged one that spells profit for the dealer, and our discounts are interesting. Write today for details.

Capitol Wind Shield Device Co., 355 Trumbull St., Hartford, Conn.

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FURNACES (Continued)

BRASS AND COPPER MELTING FURNACES (Continued)

CALUMET Foundry Equipment Co., Harvey, Ill.

CHICAGO Flexible Shaft Co., Chicago, Ill. "Stewart."

FISHER, Alfred, Chicago, Ill.

HAUCK Mfg. Co., Brooklyn, N. Y.

JOHNSON Gas Appliance Co., Cedar Rapids, Ia. (See page 697.)

KROESCHELL Bros. Co., Chicago, Ill. "Kroeschell-Schwartz."

KROESCHELL-SCHWARTZ—See Kroeschell Bros. Co.

M. R. V.—See Wise, J. B.

MONARCH Engineering & Mfg. Co., Baltimore, Md. "Steele-Harvey."

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. (See page 725.)

ROCKWELL Co., W. S., New York, N. Y.

STEELE-HARVEY—See Monarch Engineering & Mfg. Co.

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

STEWART—See Chicago Flexible Shaft Co.

WESTMACOTT Gas Furnace Co., Providence, R. I.

WHITING Foundry Equipment Co., Harvey, Ill.

WISE, J. B., Watertown, N. Y. "M. R. V."

GASOLINE FURNACES

(See Torches, Gasoline)

SOLDERING FURNACES

(See also Torches, Gasoline)

DETROIT Heating & Lighting Co., Detroit, Mich.

GAGES

CENTRE GAGES

ATHOL Machine Co., Athol, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

GOODELL-PRATT Co., Greenfield, Mass.

STARRETT Co., L. S., Athol, Mass.

WYKE, J., Wilmington, Mass.

DEPTH GAGES

ATHOL Machine Co., Athol, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

GOODELL-PRATT Co., Greenfield, Mass.

STARRETT Co., L. S., Athol, Mass.

DRILL AND WIRE GAGES

BLODGETT Mfg. Co., Rochester, N. Y.

BROWN & Sharpe Mfg. Co., Providence, R. I.

DETROIT Twist Drill Co., Detroit, Mich. (See page 687.)

MORSE Twist Drill & Machine Co., New Bedford, Mass.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

STARRETT Co., L. S., Athol, Mass.

LIMIT GAGES

BROWN & Sharpe Mfg. Co., Providence, R. I.

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

NICHOLS, W. H., Waltham, Mass.

PRATT & Whitney Co., Hartford, Conn (See page 661.)

ROGERS Works, John M., Gloucester City, N. J.

SLOAN & Chace Mfg. Co., Newark, N. J.

PLUG AND RING GAGES

AMES & Co., B. C., Waltham, Mass.

ATLAS Ball Co., Philadelphia, Pa.

BROWN & Sharpe Mfg. Co., Providence, R. I.

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

GRONKVIST Drill Chuck Co., Jersey City, N. J. (Importers.) "Johansson."

JOHANSSON—See Gronkvist Drill Chuck Co.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NICHOLS, W. H., Waltham, Mass.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

ROGERS Works, John M., Gloucester City, N. J.

SLOAN & Chace Mfg. Co., Newark, N. J.

RING GAGES

(See Gages, Plug and Ring)

SCREW PITCH GAGES

AMES & Co., B. C., Waltham, Mass.

ATHOL Machine Co., Athol, Mass.

BLODGETT Mfg. Co., Rochester, N. Y.

BROWN & Sharpe Mfg. Co., Providence, R. I.

GOODELL-PRATT Co., Greenfield, Mass.

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

NICHOLS, W. H., Waltham, Mass.

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Ediswan Sockets and Connectors,
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WE SUBMIT DESIGNS & SAMPLES

CAREFUL EXECUTION
PROMPT DELIVERIES

Crowe Name Plate and Engraving Co. Chicago

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GAGES (Continued)

SCREW PITCH GAGES (Continued)

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

REED & Prince Mfg. Co., Worcester, Mass.

STARRETT Co., L. S., Athol, Mass.

UNION Caliper Co., Orange, Mass.

SURFACE GAGES

BROWN & Sharpe Mfg. Co., Providence, R. I.

GOODELL-PRATT Co., Greenfield, Mass.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

STARRETT Co., L. S., Athol, Mass.

WYKE, J., Wilmington, Mass.

WIRE GAGES

(See Gages, Drill and Wire)

GOGGLES

MECHANICS AND WELDERS GOGGLES

ADAMS, William C., Boston, Mass.

BUFFALO Optical Co., Buffalo, N. Y.

CHICAGO Eye Shield Co., Chicago, Ill.

GUARDIAN—See Sussfeld, Lorsch & Co.

SUSSFELD, Lorsch & Co., New York, N. Y. "Guardian."

GRINDERS

CHUCKING GRINDERS

BRYANT Chucking Grinder Co., Springfield Vt.

CRANK PIN GRINDERS

LANDIS Tool Co., Waynesboro, Pa. (See page 701.)

NORTON Grinding Co., Worcester, Mass.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

TINDEL-ALBRECHT—See Tindel-Morris Co.

TINDEL-MORRIS Co., Eddystone, Pa. "Tindel-Albrecht."

CUTTER GRINDERS

See Grinders, Reamer and Cutter)

CYLINDER GRINDERS

BROWN & Sharpe Mfg. Co., Providence, R. I.

HEALD Machine Co., Worcester, Mass.

DISC GRINDERS

BATH Grinder Co., Fitchburg, Mass.

BESLY & Co., Charles H., Chicago, Ill.

BRIDGEPORT Engineering Co., Bridgeport, Conn.

DIAMOND Machine Co., Providence, R. I.

GARDNER Machine Co., Beloit, Wis.

HOYSRADT & Case, Kingston, N. Y.

RANSOM Mfg. Co., Oshkosh, Wis.

ROWBOTTOM Machine Co., Waterbury, Conn.

TAYLOR & Fenn Co., Hartford, Conn.

VALLEY City Machine Works, Grand Rapids, Mich.

DRILL GRINDERS

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NEW YANKEE—See Wilmarth & Morman Co.

SELLERS & Co., Wm., Philadelphia, Pa.

WASHBURN Shops, Worcester, Mass. "Worcester."

WILMARTH & Morman Co., Grand Rapids, Mich. "New Yankee."

WORCESTER—See Washburn Shops.

ELECTRIC PORTABLE GRINDERS

(See Drills, Electric Portable)

INTERNAL GRINDERS

BATH Grinder Co., Fitchburg, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CINCINNATI Grinder Co., Cincinnati, O.

CONOVER-OVERKAMP Machine & Tool Co. Dayton, O.

HEALD Machine Co., Worcester, Mass.

LANDIS Tool Co., Waynesboro, Pa. (See page 701.)

MODERN Tool Co., Erie, Pa.

RIVETT Lathe & Grinder Co., Boston, Mass.

THOMPSON Grinder Co., Springfield, O.

VAN NORMAN Machine Tool Co., Springfield, Mass.

PISTON RING GRINDERS

ALERT—See Harding, S. B.

BAY State Grinder Co., Worcester, Mass.

GARRIGUS Machine Co., C. G., Bristol, Conn.

HARDING, S. B., Waukesha, Wis. "Alert."

HEALD Machine Co., Worcester, Mass.

WALKER Co., O. S., Worcester, Mass.

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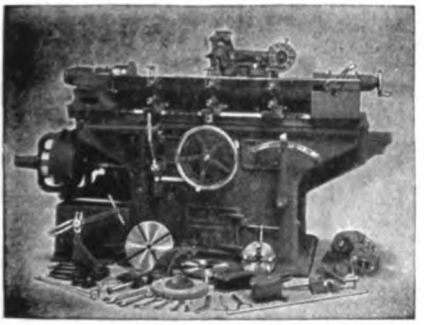
We Can Completely Equip Any Gas Engine or Automobile Grinding Department—Our Line:—

Landis Plain Grinder

Landis Plain Grinding Machines:—For line bearings of crank shafts—cam shaft bearings—valves (straight portion), push rods—pistons—piston rings—transmission shafts—axles, etc.

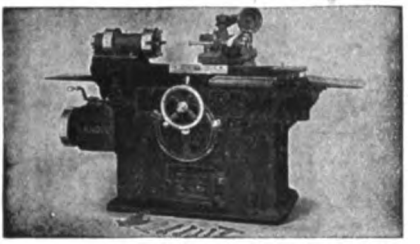
Landis Crank Grinder

Landis Crank Grinding Machine:—Capacity for single and multiple throw crank shafts with throws up to 8" single and 6" multiple.



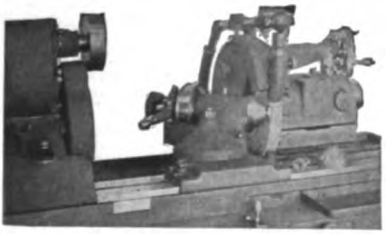
Landis Universal Grinder

Landis Universal Grinding Machines:—For valves (straight and taper portions), magnetos—piston rings (face grind), besides for tools—jigs, bushings, etc. This machine grinds—straight or taper internal or external—and is adapted for use with attachments such as magnetic chuck—valve seat grinding attachment—cam grinding attachment—cutter attachments, etc.

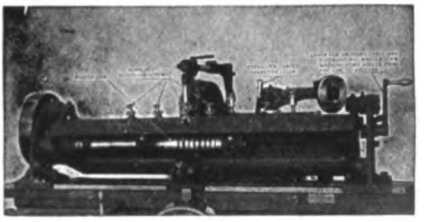


Landis Internal Grinder

Landis Internal Grinding Machine:—Transmission and differential gears—piston pin bushings—can be arranged for use with water—or with quick acting collet chuck.



Valve Seat Attachment:—For valve seats; also any other work of like nature. Graduated for swiveling to 90°.



Landis Cam Grinding Attachment

Landis Cam Grinding Attachments:—For use on Landis Universal and Plain grinding machines, both detachable and integral cam grinding attachments are each built in 3 sizes to suit our machines.

LANDIS TOOL COMPANY, Waynesboro, Pa.

New York Office, Fulton Building, 50 Church Street, Walter H. Foster Company, Managers

AGENTS: Dewstoe Machine Tool Co., Birmingham, Ala. Harron, Rickard & McCone, San Francisco and Los Angeles. C. W. Burton Griffiths & Co., London and Glasgow. Schuchardt & Schutte, Berlin Stockholm, St. Petersburg, Copenhagen. Alfred H. Schutte, Cologne, Brussels, Liege, Milan, Paris, Barcelona and Bilbao. Donauwerk Ernst Krause & Co., Wien, Prag and Budapest. A. R. Williams Machinery Co., Toronto. Williams & Wilson, Montreal, Canada. Andrews & George, Yokohama, Japan.

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GRINDERS (Continued)

PLAIN TOOL GRINDERS

ATHOL Machine Co., Athol, Mass.

BAIRD Machine Co., Bridgeport, Conn.

BATH Grinder Co., Fitchburg, Mass.

BLOUNT Co., J. G., Everett, Mass. (See page 713.)

BROWN & Sharpe Mfg. Co., Providence, R. I.

BUILDERS Iron Foundry, Providence, R. I.

CANTON Foundry & Machine Co., Canton, O. "Universal." (See page 677.)

CLIZBE Bros. Mfg. Co., Plymouth, Ind. "Crown," "Queen," "Imperial," "Plymouth."

CROWN—See Clizbe Bros. Mfg. Co.

DIAMOND Machine Co., Providence, R. I.

FITCHBURG Grinder Co., Fitchburg, Mass.

IMPERIAL—See Clizbe Bros. Mfg. Co.

LA SALLE Machine & Tool Co., La Salle, Ill.

LANDIS Tool Co., Waynesboro, Pa. (See page 701.)

LUTHER Grinder Mfg. Co., Milwaukee, Wis.

MODERN Tool Co., Erie, Pa.

NORTON Grinding Co., Worcester, Mass.

OESTERLEIN Machine Co., Cincinnati, O. "Ohio."

OHIO—See Oesterlein Machine Co.

OTIS Machine Works, Rochester, N. Y.

PARTRIDGE, E. O., Chicago, Ill.

PLYMOUTH—See Clizbe Bros. Mfg. Co.

QUEEN—See Clizbe Bros. Mfg. Co.

RANSOM Mfg. Co., Oshkosh, Wis.

ROYERSFORD Foundry & Machine Co., Royersford, Pa.

ST. LOUIS Machine Tool Co., St. Louis, Mo. "Western."

STAPF & Co., John B., Dunkirk, N. Y.

TABOR Mfg. Co., Philadelphia, Pa. "Taylor."

TAYLOR—See Tabor Mfg. Co.

UNIVERSAL—See Canton Foundry & Machine Co.

VALLEY City Machine Works, Grand Rapids, Mich.

WALKER Grinder Co., Worcester, Mass.

WEBSTER & Perks Tool Co., Springfield, O.

WESTERN—See St. Louis Machine Tool Co.

REAMER AND CUTTER GRINDERS

BATH Grinder Co., Fitchburg, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CINCINNATI Milling Machine Co., Cincinnati, O.

CLOUGH, R. M., Tolland, Conn.

CONOVER-OVERKAMP Machine & Tool Co., Dayton, O.

GREENFIELD Machine Co., Greenfield, Mass.

INGERSOLL Milling Machine Co., Rockford, Ill.

LE BLOND Machine Tool Co., R. K., Cincinnati, O.

OESTERLEIN Machine Co., Cincinnati, O. "Ohio."

OHIO—See Oesterlein Machine Co.

THOMPSON Grinder Co., Springfield, O.

WALKER Co., O. S., Worcester, Mass.

WELLS & Son Co., F. E., Greenfield, Mass.

WILMARTH & Morman Co., Grand Rapids, Mich.

WOODS Engineering Co., Alliance, O.

SURFACE GRINDERS

BATH Grinder Co., Fitchburg, Mass.

BAY State Grinder Co., Worcester, Mass.

BLANCHARD Machine Co., Cambridge, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CONOVER-OVERKAMP Machine & Tool Co., Dayton, O.

DIAMOND Machine Co., Providence, R. I.

GARRIGUS Machine Co., C. G., Bristol, Conn.

GARVIN Machine Co., New York, N. Y.

HEALD Machine Co., Worcester, Mass.

LA SALLE Machine & Tool Co., La Salle, Ill.

LANDIS Tool Co., Waynesboro, Pa. (See page 701.)

PERSONS-ARTER Machine Co., Worcester, Mass.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

ROWBOTTOM Machine Co., Waterbury, Conn.

SPRINGFIELD Mfg. Co., Bridgeport, Conn.

THOMPSON Grinder Co., Springfield, O.

VALLEY City Machine Works, Grand Rapids, Mich.

WALKER Co., O. S., Worcester, Mass.

WILMARTH & Morman Co., Grand Rapids, Mich.

SWING FRAME GRINDERS

PITTSBURGH Grinding Wheel Co., Rochester, Pa.

SAFETY Emery Wheel Co., Springfield, O.

SPRINGFIELD Mfg. Co., Bridgeport, Conn.

TUCKER Machine Co., Cincinnati, O.

UNIVERSAL GRINDERS

AMERICAN Tool & Machine Co., Boston, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CINCINNATI Grinder Co., Cincinnati, O.

CONOVER-OVERKAMP Machine & Tool Co., Dayton, O.

LANDIS Tool Co., Waynesboro, Pa. (See page 701.)

MODERN Tool Co., Erie, Pa.

NORTON Grinding Co., Worcester, Mass.

THOMPSON Grinder Co., Springfield, O.

WILMARTH & Marmon Co., Grand Rapids, Mich.

Complete Index to Classification appears on Pages 8 to 27.

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Gurney Ball Bearing

The ONLY ball bearing combining the following important features: Full complement of balls; continuous, unbroken and full depth raceways.

The bearing also has a non-wearable single piece ball separator. It is equal to the best in radial capacity and superior to all other annular ball bearings in thrust capacity. Ask about our RADIO-THRUST bearing. Made in standard sizes. Write for prices and catalog.

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JAMESTOWN, N. Y.

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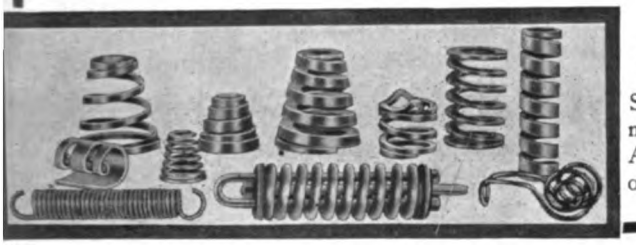
Huron & Kinsgbury Sts., Chicago

SPRINGS

SPIRAL and FLAT

Steel Brass and Phosphor Bronze



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The Best Bearing Metal on the Market

Fine Anti-Friction Qualities and Great Durability

Gives Satisfactory Service Under All Conditions

Will run cool with minimum wear in any connective rod or crank shaft bearing.
Handles like any high grade babbitt.

FAHRIG METAL CO., 34 Commerce Street, New York

VELLUMOID GASKETS SHEET PACKING

For

Oil, Gasoline & Water Connections

Makes a non - leakable connection which stays so

Tough—Compressible—Flexible.

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GRINDERS (Continued)

WET TOOL GRINDERS

BLOUNT Co., J. G., Everett, Mass. (See page 713.)

BRIDGEPORT Safety Emery Wheel Co., Bridgeport, Conn.

DIAMOND Machine Co., Providence, R. I.

GISHOLT Machine Co., Madison, Wis.

HOYSRADT & Case, Kingston, N. Y.

LELAND-GIFFORD Co., Worcester, Mass.

LUTTER & Gies Co., Milwaukee, Wis-. "Milwaukee."

MILWAUKEE—See Lutter & Gies.

RANSOM Mfg. Co., Oshkosh, Wis.

SELLERS & Co., Wm., Philadelphia, Pa.

SPRINGFIELD Mfg. Co., Bridgeport, Conn.

STERLING Grinding Wheel Co., Tiffin, O.

TAYLOR & Fenn Co., Hartford, Conn.

TUCKER Machine Co., Cincinnati, O.

VALLEY City Machine Works, Grand Rapids, Mich.

WEBSTER & Perks Tool Co., Springfield, O.

HAMMERS

BRASS AND COPPER HAMMERS

ELECTRIC Materials Co., North East, Pa.

EUREKA Co., North East, Pa. (See page 333.)

GOODELL-PRATT Co., Greenfield, Mass.

HORAT, J., Lafayette, Ind.

UNION Hardware Co., Torrington, Conn.

WELCH Co., Thomas F., Boston, Mass.

CLAW HAMMERS

ATHA Tool Co., Newark, N. J.

CENTRAL Hardware Co., Philadelphia, Pa.

CHENEY Hammer Co., H., Little Falls, N. Y.

MAYDOLE Hammer Co., David, Norwich, N. Y.

VAUGHAN & Bushnell Mfg. Co., Chicago, Ill.

WARNER Hammer Co., Cromwell, Conn.

MACHINISTS HAMMERS

ATHA Tool Co., Newark, N. J.

BEALL Bros., Alton, Ill.

BILLINGS & Spencer Co., Hartford, Conn.

BUFFUM Tool Co., Louisiana, Mo.

CHENEY Hammer Co., H., Little Falls, N. Y.

DROP Forging Co. of New York, Jersey City, N. J. "Spartan."

EVANSVILLE Tool Works, Evansville, Ind.

HELLER Bros. Co., Newark, N. J.

HYDE Park Mfg. Co., Bernharts, Pa.

MAYDOLE Hammer Co., David., Norwich, N. Y.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PERFECT HANDLE—See Smith & Co.

PEXTO—See Peck, Stow & Wilcox Co.

SMITH & Co., H. D., Plantsville, Conn. "Perfect Handle."

SPARTAN—See Drop Forging Co. of New York.

VAUGHAN & Bushnell Mfg. Co., Chicago, Ill.

VLCHEK Tool Co., Cleveland, O.

WARNER Hammer Co., Cromwell, Conn.

PNEUMATIC HAMMERS

(See Tools, Pneumatic)

POWER HAMMERS

BEAUDRY & Co., Boston, Mass. "Champion," "Peerless."

BECHE—See Nasel Engineering & Machine Works.

BILLINGS & Spencer Co., Hartford, Conn.

BLISS Co., E. W., Brooklyn, N. Y.

BRADLEY & Son, C. C., Syracuse, N. Y.

CHAMPION—See Beaudry & Co.

CHAMPION Blower & Forge Co., Lancaster, Pa.

DIENELT & Eisenhardt, Philadelphia, Pa.

JUSTICE & Co., P. S., Philadelphia, Pa.

LITTLE GIANT—See Mayer Bros. Co.

McLANE, J. B., North Reading, Mass.

MAC Gowan & Finigan Foundry & Machine Co., St. Louis, Mo. "Perfect."

MASSILLON Foundry & Machine Co., Massillon, O.

MAYER Bros. Co., Mankato, Minn. "Little Giant."

MERRILL Bros. Co., Maspeth, N. Y.

NAZEL Engineering & Machine Works, Philadelphia, Pa. "Beche."

NILES-BEMENT-POND Co., New York, N. Y.

PEERLESS—See Beaudry & Co.

PERFECT—See MacGowan & Finigan Foundry & Machine Co.

PETTINGELL Machine Co., Amesbury, Mass.

QUICKWORK—See Smith, H. Collier.

SCRANTON & Co., New Haven, Conn.

SMITH, H. Collier, Detroit, Mich. "Quickwork."

TOLEDO Machine & Tool Co., Toledo, O.

WATERBURY Farrel Foundry & Machine Co., Waterbury, Conn.

WILLIAMS, White & Co., Moline, Ill.

STEAM HAMMERS

ALLIANCE Machine Co., Alliance, O.

BELL—See Buffalo Foundry & Machine Co.

BEMENT—See Niles-Bement-Pond Co.

BUFFALO Foundry & Machine Co., Buffalo, N. Y. "Bell."

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HAMMERS (Continued)

STEAM HAMMERS (Continued)

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ERIE Foundry Co., Erie, Pa.

McDOUGALL & Potter Co., New York, N. Y.

MASSILLON Foundry & Machine Co., Massillon, O.

MORGAN Engineering Co., Alliance, O.

NILES-BEMENT-POND Co., New York, N. Y. "Bement."

HANDLES

FILE AND TOOL HANDLES

AMERICAN File Sharpener Co., Brooklyn, N. Y.

CASSADY-FAIRBANK Mfg. Co., Chicago, Ill.

CHAPIN-STEPHENS Co., Pine Meadow, Conn.

EARMAN & Muzante, Port Washington, N. Y.

GROVER File Co., Nashua, N. H.

KAALOT Mfg. Co., Chicago, Ill.

O'NEIL, Jr., J. H., Pawtucket, R. I.

OHIO Tool Co., Charleston, W. Va.

OSGOOD, J. L., Buffalo, N. Y.

PIQUA Handle & Mfg. Co., Piqua, O.

TROY File Works, Troy, N. Y.

UNION Hardware Co., Torrington, Conn.

ZELNICKER Supply Co., Walter A., St. Louis, Mo.

HANGERS

GARAGE DOOR HANGERS AND HINGES

LOUDEN Machinery Co., Fairfield, Ia.

MYERS & Bro., F. E., Ashland, O.

RICHARDS-WILCOX Mfg. Co., Aurora, Ill.

STANLEY Works, New Britain, Conn. (See page 269.)

HEADS

BORING HEADS

MARVIN & Casler Co., Canastota, N. Y.

HEATERS

GLUE HEATERS

ADVANCE Machinery Co., Toledo, O. "Wetmore." (See page 609.)

FRANCIS Co., Chas. E., Rushville, Ind.

WETMORE—See Advance Machinery Co.

SPECIAL GARAGE HEATERS

BUCKEYE Furnace Co., Cleveland, O.

COSY—See Superior Mfg. Co.

EDWARDS Mfg. Co., Cincinnati, O. "Reo."

FULLER & Warren Co., Troy, N. Y. "Stewart."

HONN, Peter, Grand Rapids, Mich.

LOMBARDI Motor Car Co., Derby, Conn. "Sunbeam."

REO—See Edwards Mfg. Co.

RIPPLEY Mfg. Co., Grafton, Ill.

SCIENTIFIC Heater Co., Power Ave., Cleveland, O. (See page 717.)

STEWART—See Fuller & Warren Co.

SUNBEAM—See Lombardi Motor Car Co.

SUPERIOR Mfg. Co., Pittsburgh (N. S.), Pa. "Cosy."

HOLDERS

GARAGE DOOR HOLDERS AND OPENERS

CLAY, John H., 1318-20 Ridge Ave., Philadelphia, Pa. (See page 707.)

GRIFFIN Mfg. Co., Erie, Pa.

RICHARDS-WILCOX Mfg. Co., Aurora, Ill.

RIXSON Co., Oscar C., Chicago, Ill.

SHELBY Spring Hinge Co., Shelby, O.

LATHE AND PLANER TOOL HOLDERS

AMERICAN Tool & Machine Co., Boston, Mass.

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)

BOWN Machine Co., Battle Creek, Mich.

CARR—See Thompson & Son Co.

CELFOR Tool Co., Buchanan, Mich.

CHAMPION—See Western Tool & Mfg. Co.

O. K. Tool Holder Co., Shelton, Conn.

READY Tool Co., Bridgeport, Conn. "Red-E."

RED-E—See Ready Tool Co.

RIGID Tool Holder Co., Baltimore, Md.

THOMPSON & Son Co., Henry G., New Haven, Conn. "Carr."

TRIANGULAR Tool Co., Erie, Pa.

UNION Caliper Co., Orange, Mass.

WESTERN Tool & Mfg. Co., Springfield, O. "Champion."

WILLIAMS & Co., J. H., Brooklyn, N. Y.

HORSES

HORSES, TRESTLES AND TRUCKS

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. "Hildreth." (See page 491.)

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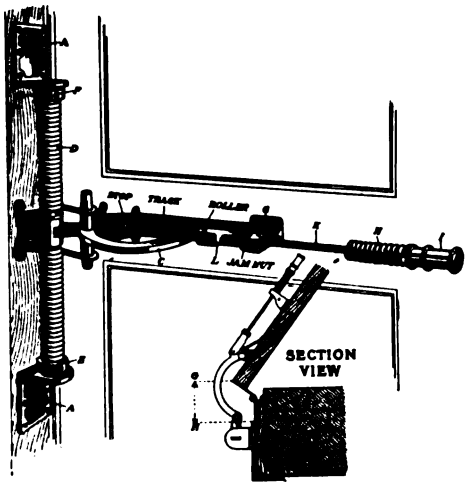

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HORSES, TRESTLES AND TRUCKS (Continued)

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JOHNSTOWN Automobile Co., Johnstown, Pa.

NELSON Wagon & Auto Works, Olof, Chicago, Ill.

INDICATORS

SPEED INDICATORS

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BROWN Instrument Co., Philadelphia, Pa.

DISSTON & Sons, Henry, Philadelphia, Pa.

GRANT Mfg. & Machine Co., Bridgeport, Conn. "Tabor."

QUEEN-GRAY Co., Philadelphia, Pa.

STARRETT Co., L. S., Athol, Mass.

TABOR—See Grant Mfg. & Machine Co.

VEEDER Mfg. Co., Hartford, Conn.

WALTHAM Watch Co., Waltham, Mass. (See page 161.)

WOODMAN Mfg. & Supply Co., R., Boston, Mass.

INSTRUMENTS

GAS ANALYSIS INSTRUMENTS.

COAPCO—See Combustion Appliances Co.

COMBUSTION Appliances Co., 1775 Lunt Ave., Chicago, Ill. "Coapco."

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CARBOGAS Co., Toledo, O.

DETECTORPHONE—See Boston Talking Machine Co.

HOPEWELL Bros., Watertown, Mass. "Vibracator." (See page 617.)

PILLING & Son Co., G. P., Arch & 23d Sts., Philadelphia, Pa. "Phonendoscope."

PHONENDOSCOPE—See Pilling & Son Co.

SONOSCOPE—See American Electric Co.

VIBRACATOR—See Hopewell Bros.

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STEEL TESTING INSTRUMENTS

SCLEROSCOPE—See Shore Instrument & Mfg. Co.

SHORE Instrument & Mfg. Co., New York, N. Y. "Scleroscope."

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BOYNTON & Plummer, Chester Depot, Vt.

BUFFALO Forge Co., Buffalo, N. Y.

ILLINOIS Iron & Bolt Co., Carpentersville, Ill.

NATIONAL Novelty Corp., New York, N. Y.

ROOTS Co., P. H. & F. M., Connersville, Ind.

SWETT Iron Works, A. L., Medina, N. Y.

JOINTERS

GLUE JOINTERS

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

FALLS Machine Co., Sheboygan Falls, Wis. (See pages 300 and 301.)

FAY & Egan Co., Cincinnati, O.

LINDERMAN Machine Co., Muskegon, Mich.

KETTLES

SODA AND POTASH KETTLES

BROWN & Sharpe Mfg. Co., Providence, R. I.

GRAY & Prior Machine Co., Hartford, Conn.

KOVEN & Bro., L. O., Jersey City, N. J.

MANUFACTURING, Equipment & Engineering Co., Boston, Mass.

MATHER & Warchter, Cleveland, O.

KEYS

MACHINE KEYS

MOLTRUP Steel Products Co., Beaver Falls, Pa. (See page 705.)

PENNSYLVANIA Shafting Co., Spring City, Pa.

STANDARD Gauge Steel Co., Beaver Falls, Pa. (See page 813.)

WHITNEY Mfg. Co., Hartford, Conn. "Woodruff." (See page 723.)

WOODRUFF—See Whitney Mfg. Co.

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MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco." (See page 671.)

VLCHEK Tool Co., Cleveland, O.

WHITAKER Mfg. Co., Chicago, Ill. (See page 765.)

KNURLS

KNURLING WHEELS

ALERT Tool Co., Philadelphia, Pa.

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)

BILLINGS & Spencer Co., Hartford, Conn.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

CINCINNATI Screw Co., Twightwee, O. (See page 571.)

MILLER Tool Co., New Britain, Conn.

O. K. Tool Holder Co., Shelton, Conn.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

WELCH Co., Thomas F., Boston, Mass.

LACQUERS

METAL LACQUERS

AMERICAN Lacquer Co., Bridgeport, Conn.

ARLINGTON Co., 725-27 Broadway, New York, N. Y. (See page 535.)

BARRETT & Co., M. L., Chicago, Ill.

CELLULOID Zapon Co., New York, N. Y.

EGYPTIAN Lacquer Mfg. Co., New York, N. Y.

HANSON & Van Winkle Co., Newark, N. J.

KALBFLEISCH Co., Franklin H., Broadway & 16th St., New York, N. Y. (See page 681.)

MAAS & Waldstein Co., New York, N. Y.

NIKOLAS & Co., G. J., Chicago, Ill.

ZINSSER & Co., W., New York, N. Y.

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BENCH OR PRECISION LATHES

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AMES & Co., B. C., Waltham, Mass.

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GOODELL-PRATT Co., Greenfield, Mass.

HARDINGE Bros., Chicago, Ill.

OTIS Machine Works, Rochester, N. Y.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

REMINGTON Tool & Machine Co., Boston, Mass.

RIVETT Lathe & Grinder Co., Boston, Mass.

SLOAN & Chace Mfg. Co., Newark, N. J.

SOUTH Bend Lathe Works, 600 E. Madison St., South Bend, Ind. (See page 711.)

STARK Tool Co., Waltham, Mass. (See page 711.)

VAN NORMAN Machine Tool Co., Springfield, Mass.

WALTHAM Machine Works, Waltham, Mass.

BUFFING LATHES

(See Machines, Buffing and Polishing)

CRANK PIN LATHES

AMERICAN Tool Works Co., Cincinnati, O.

LODGE & Shipley Machine Tool Co., Cincinnati, O.

TINDELL-MORRIS Co., Eddystone, Pa.

ENGINE LATHES

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BARNES Drill Co., Rockford, Ill.

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BRADFORD Machine Tool Co., Cincinnati, O.

CARROLL-JAMIESON Machine Tool Co., Batavia, O.

CHAMPION Tool Works Co., Cincinnati, O.

CHARD Lathe Co., Newcastle, Ind.

CINCINNATI Lathe & Tool Co., Cincinnati, O.

CONOVER-OVERKAMP Machine & Tool Co., Dayton, O.

DAVIS Machine Tool Co., Rochester, N. Y.

ECONOMY—See Rockford Lathe & Drill Co.

FAY Machine Tool Co., Philadelphia, Pa.

FITCHBURG Machine Works, Fitchburg, Mass. "Lo-Swing."

FLATHER & Co., Nashua, N. H.

GIDDINGS & Lewis Mfg. Co., Fond du Lac, Wis.

GREAVES-KLUSMAN Tool Co., Cincinnati, O. (See page 571.)

HAMILTON Machine Tool Co., Hamilton, O.

HENDEY Machine Co., Torrington, Conn.

LE Blond Machine Tool Co., R. K., Cincinnati, O.

LO-SWING—See Fitchburg Machine Works.

LODGE & Shipley Machine Tool Co., Cincinnati, O.

MONARCH Machine Tool Co., Sidney, O. (See page 859.)

MORRIS Machine Tool Co., John B., Cincinnati, O.

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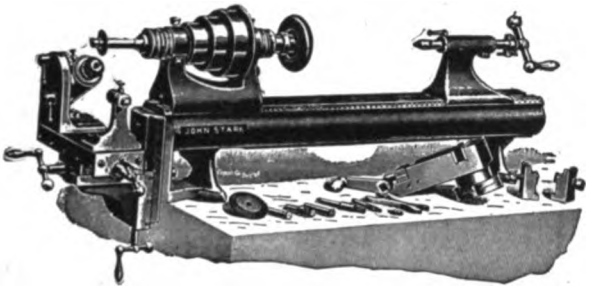

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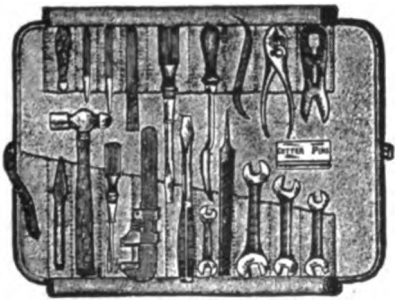

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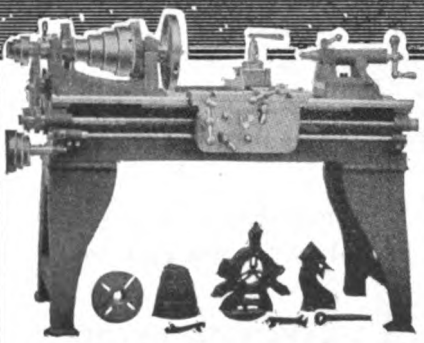

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LATHES

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NILES-BEMENT-POND Co., New York, N. Y. "Pond."

POND—See Niles-Bement-Pond Co.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

PUTNAM Machine Co., Fitchburg, Mass.

RAHN-LARMON Co., Cincinnati, O.

REED-PRENTICE Co., Worcester, Mass.

ROBBINS Machine Co., Worcester, Mass.

ROCKFORD Lathe & Drill Co., Rockford, Ill. "Economy."

ROCKFORD Tool Co., Rockford, Ill.

SEBASTIAN Lathe Co., 134-36 Culvert St., Cincinnati, O. (See page 711.)

SENECA Falls Mfg. Co., Seneca Falls, N. Y. "Star."

SHEPARD Lathe Co., Cincinnati, O.

SOUTH Bend Lathe Works, 600 E. Madison St., South Bend, Ind. (See page 711.)

SPRINGFIELD Machine Tool Co., Springfield, O.

STAPF & Co., John B., Dunkirk, N. Y.

STAR—See Seneca Falls Mfg. Co.

VON Wyck Machine Tool Co., Cincinnati, O.

WALCOTT & Wood Machine Tool Co., Jackson, Mich.

WHITCOMB-BLAISDELL Machine Tool Co., Worcester, Mass.

WILLARD Machine & Tool Co., Cincinnati, O.

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WARNER & Swasey Co., Cleveland, O.

YANKEE—See Meriden Machine Tool Co.

POLISHING LATHES

(See Machines, Buffing and Polishing)

PRECISION LATHES

(See Lathes, Bench or Precision)

TURRET LATHES

ACME Machine Tool Co., Cincinnati, O. (See page 571.)

AMERICAN Tool Works Co., Cincinnati, O.

AMERICAN Tool & Machine Co., Boston, Mass.

BARDONS & Oliver, Cleveland, O.

BOYE & Emmes Machine Tool Co., Cincinnati, O.

BRADFORD Machine Tool Co., Cincinnati, O.

BULLARD Machine Tool Co., Bridgeport, Conn.

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DAVIS Machine Tool Co., Rochester, N. Y.

DRESES Machine Tool Co., Cincinnati, O.

FAY & Scott, Dexter, Me.

FOSTER Machine Co., Elkhart, Ind.

GARVIN Machine Co., New York, N. Y.

GISHOLT Machine Co., Madison, Wis.

HAMILTON Machine Tool Co., Hamilton, O.

HARTNESS—See Jones & Lamson Machine Co.

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JONES & Lamson Machine Co., Springfield, Vt. "Hartness."

LE BLOND Machine Tool Co., R. K., Cincinnati, O.

LIBBY—See International Machine Tool Co.

LODGE & Shipley Machine Tool Co., Cincinnati, O.

MERIDEN Machine Tool Co., Meriden, Conn

MODERN Machine Tool Co., Cincinnati, O.

MONARCH Machine Tool Co., Sidney, O. (See page 859.)

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 753.)

POTTER & Johnston Machine Co., Pawtucket, R. I.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

RAHN-LARMON Co., Cincinnati, O.

REED-PRENTICE Co., Worcester, Mass.

SPRINGFIELD Machine Tool Co., Springfield, O.

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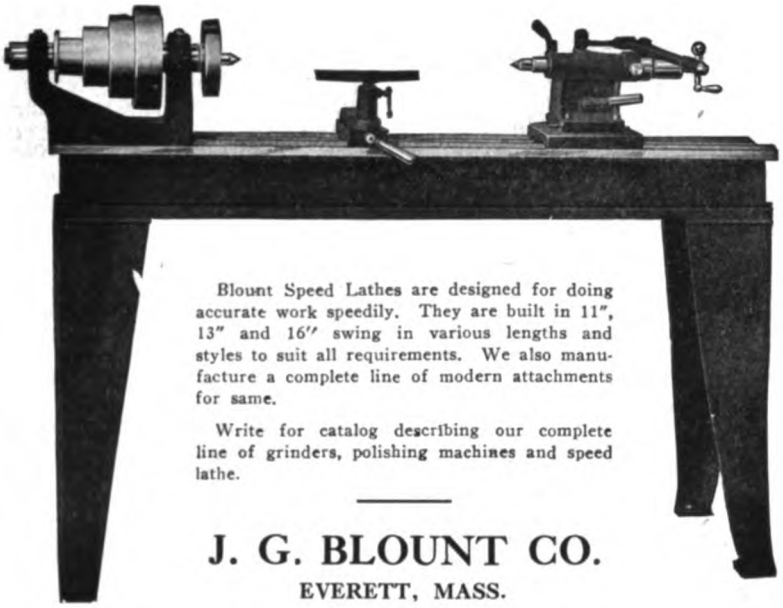

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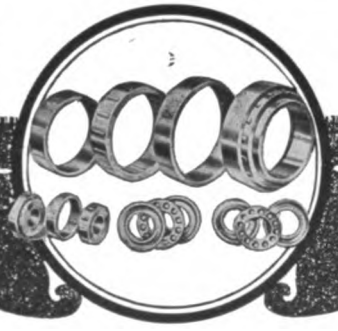

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EVERETT & Son, A., Auburn, N. Y.

KNIGHT & Son, H. W., Seneca Falls, N. Y.

PERFECT—See Benskin Mfg. Co.

TIMMIS & Clissold, Bound Brook, N. J.

WELLMAN Pattern-Supply Co., Cleveland, O.

LEVELS

SPIRIT LEVELS

ATHOL Machine Co., Athol, Mass.

CHAPIN-STEPHENS Co., Pine Meadow Conn.

COLUMBIA—See Smith, E. G.

COOK—See Jackson, S. Robert.

DISSTON & Sons, Henry, Philadelphia, Pa.

GOODELL-PRATT Co., Greenfield, Mass.

JACKSON, S. Robert, Watertown, N. Y. "Cook."

SAND & Sons, J., Detroit, Mich.

SMITH, E. G., Tampa, Fla. "Columbia."

STANLEY Rule & Level Co., New Britain, Conn.

STARRETT Co., L. S., Athol, Mass.

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CLINTON Wire Cloth Co., Clinton, Mass.

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DEXTER Metal Mfg. Co., Camden, N. J.

DURAND-STEEL Locker Co., Chicago, Ill.

FEDERAL Steel Fixture Co., Chicago, Ill.

HART & Hutchinson Co., New Britain, Conn.

HETTS Co., Detroit, Mich.

JEFFERIS Co., R. W., Camden, N. J.

LYON Metallic Mfg. Co., Aurora, Ill. (See page 715.)

MANUFACTURING Equipment & Engineering Co., Boston, Mass.

SHULTS & Co., H. H., Gowanda, N. Y.

SMITH Wire & Iron Works, F. P., Chicago, Ill.

TERRELL'S Equipment Co., Grand Rapids, Mich.

VAN Dorn Iron Works, Cleveland, O.

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CUTTING LUBRICANTS

ACME—See Cataract Refining & Mfg. Co.

AJAX—See Phoenix Oil Co.

AMERICAN Oil Products Co., Buffalo, N. Y. "Lardo."

CASCADE—See Cataract Refining & Mfg. Co.

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CONNECTICUT Oil Co., Waterbury, Conn.

CUT-RITE—See Phoenix Oil Co.

DRILLINE—See Krembs & Co.

FAULTLESS—See Hawkeye Oil Co.

FILEINE—See Houghton & Co.

FOOTE, Pierson & Co., New York, N. Y. "Lubria."

GERMANIA LUBRO—See Oil City Oil & Grease Co.

HAWKEYE Oil Co., Waterloo, Ia. "Faultless."

HAWS, Geo. A., 142-44 Front St., New York, N. Y. "Panhard." (See page 353.)

HOUGHTOLARD—See Houghton & Co.

HOUGHTON & Co., E. F., Philadelphia, Pa. "Fileine," "Houghtolard."

KREMBS & Co., Chicago, Ill. "Drilline."

LARDO—See American Oil Products Co.

L-O—See Richards, G. Whitfield.

LUBE-WELL—See Richards, G. Whitfield.

LUBRI-KOOL—See Richards, G. Whitfield.

LUBRIA—See Foote, Pierson & Co.

MIDDLE States Oil Co., Cleveland, O. "Perfection."

MYSTIC—See Cataract Refining & Mfg. Co.

NAGLENE—See Ulco Oil Co.

OIL City Oil & Grease Co., Oil City, Pa. "Germania Lubro."

PANHARD—See Haws, Geo. A.

PERFECTION—See Middle States Oil Co.

PHOENIX Oil Co., Cleveland, O. "Ajax," "Cut-rite."

RICHARDS, G. Whitfield, Philadelphia, Pa. "Lube-Well," "L-O," "Lubri-Kool."

SULLIVAN Oil Co., Chicago, Ill.

ULCO Oil Co., Detroit, Mich. "Naglene."

WAVERLY Oil Works Co., Pittsburg, Pa. (See page 351.)

MACHINERY

DEALERS IN MACHINERY

(This is a list of Dealers in Machinery who advertise in this Publication)

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (See page 491.)

MONTGOMERY & Co., 105-07 Fulton St., New York, N. Y. (See page 705.)

Complete Index to Classification appears on Pages 8 to 27.

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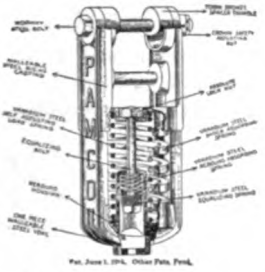
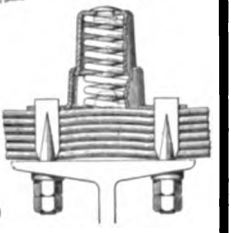
Pamco Specialties



Pamco Quadruple Spring Shock and Rebound Absorber

$15.00



Pamco Metallic Spring Bumper

More resilient than rubber

Price per pair $1.00

Pamco Automatic Spring Leaf Oil Box

Prevent squeaky springs

75c each

AUTO DEVICES CO., 3214 Locust St.
ST. LOUIS, MO.

FOR

MANUFACTURERS
DISTRIBUTORS
JOBBERS
DEALERS
AND
GARAGE MEN

LYON STEEL PRODUCTS

STEEL RACKS
For the Storage of Motor Car Repair Parts.

STEEL TIRE RACKS
For Tire Display and Storage.

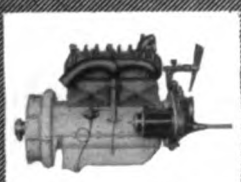
STEEL LOCKERS
For Protection from Fire and Theft.

STEEL SHELVING
For the Storage and Display of Accessories.

LYON METALLIC MFG. CO.

Chicago AURORA, ILL. Detroit
New York Cincinnati Pittsburgh

LYCOMING MOTORS



LYCOMING FOUNDRY & MACHINE CO.

AUTOMOBILE MOTORS

WILLIAMSPORT, PA.

LYCOMING MOTORS

LYCOMING MOTORS

LYCOMING MOTORS

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MACHINERY (Continued)

SAND MIXING AND CONVEYING MACHINERY

BARBOUR-STOCKWELL Co., Cambridgeport, Mass.

PANGBORN Corp., Hagerstown, Md.

STANDARD Sand & Machine Co., Cleveland, O.

MACHINES

ABRASIVE METAL CUTTING MACHINES

SLACK Mfg. Co., Springfield, Vt.

AUTOGENOUS WELDING MACHINES

ADMIRAL Welding Machine Co., Kansas City Mo.

ASHTON, Laird & Co., New York, N. Y. "Astra."

ASTRA—See Ashton, Laird & Co.

BISHOP-BABCOCK-BECKER Co., Cleveland, O.

BUCKEYE—See Macleod Co.

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (See page 717.)

DAVIS-BOURNONVILLE Co., Jersey City, N. J.

DYER Co., G. H., Cambridge, Mass.

ECONOMY Welding Machine Co., Kansas City, Mo.

ELLINGER Mfg. Co., Walter, Sheboygan, Wis.

GEM—See Rice & Dayton Mfg. Co.

GENERAL Welding Co., Hoboken, N. J. "Ideal."

HAUCK Mfg. Co., Brooklyn, N. Y.

HAVENS Bros. Mfg. & Supply Co., Denver, Colo.

HENDERSON-WILLIS Welding & Cutting Co., St. Louis, Mo.

IDEAL—See General Welding Co.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 869.)

LITTLE GEM—See Rice & Dayton Mfg. Co.

MACLEOD Co., Walter, Cincinnati, O. "Buckeye."

MANUFACTURERS Welding Co., Brooklyn, N. Y. "U. O. C."

METAL Welding & Supply Co., Denver, Colo.

METALS Welding Co., Cleveland, O.

MILBURN Co., Alexander, Baltimore, Md.

NEV-O-FAIL—See Turner Brass Works.

OXWELD Acetylene Co., Chicago, Ill.

OXY-CARBI Co., New Haven, Conn.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. (See page 553.)

RICE & Dayton Mfg. Co., Cedar Falls, Ia. "Gem," "Little Gem."

RUSS—See Stewart, F. W.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SCHAAP Automobile Co., Brooklyn, N. Y.

SCHEMMEL Welding Machine Works, Wapakoneta, O. (See page 825.)

SEARCHLIGHT Co., Chicago, Ill.

STEWART, F. W., 1402-06 Michigan Ave., Chicago, Ill. "Russ." (See page 375.)

SUPERIOR Oxy-Acetylene Machine Co., Hamilton, O.

TOLMAN Mfg. Co., Boston, Mass.

TURNER Brass Works, Sycamore, Ill. "Nev-O-Fail."

U. O. C.—See Manufacturers Welding Co.

VULCAN Brazing & Machine Co., Philadelphia, Pa.

VULCAN Process Co., Minneapolis, Minn.

WATERHOUSE Welding Co., Boston, Mass.

WELDRITE Co., Long Island City, N. Y.

BLUE PRINTING MACHINES

BLUE Streak—See Revolute Machine Co.

BUCKEYE Engine Co., Salem, O.

EVERETT-McADAM—See Revolute Machine Co.

HALF MOON—See Revolute Machine Co.

KEUFFEL & Esser Co., Hoboken, N. J.

PEASE Co., C. F., Chicago, Ill.

REVOLUTE Machine Co., New York, N. Y "Blue Streak," "Half Moon," "Everett-McAdam."

BOLT HEADING MACHINES

ACME Machinery Co., Cleveland, O.

AJAX Mfg. Co., Cleveland, O.

BROWN Co., H. B., East Hampton, Conn. "Davis."

BURDICT—See Howard Iron Works.

DAVIS—See Brown Co.

HOWARD Iron Works, Buffalo, N. Y. "Burdict."

NATIONAL Machinery Co., Tiffin, O.

NEW Doty Mfg. Co., Jamesville, Wis.

NILES-BEMENT-POND Co., New York, N. Y.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

BOLT POINTING MACHINES

ACME Machinery Co., Cleveland, O.

BROWN Co., H. B., East Hampton, Conn. "Merriman."

BURDICT—See Howard Iron Works.

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The Famous Scientific Safety Garage Heater

Thousands in use. Artificial or natural gas. The only practical heater for public or private garage. Built in three sizes. Listed as safe by world's fire-hazard experts.

Fool-proof
Explosion-proof

Write for Literature

The Scientific Heater Co.
Power Avenue Cleveland, O.

DO IT YOURSELF

Don't send out the work you should do in your own shop. Get our

Real Moulding Outfit for $50

and add to your profits.

This Outfit will reclaim cracked and broken castings and automobile cylinders, aluminum crankcases and do the work of the most expensive welders.

It is Cox Standard in every detail. The biggest value for the money ever offered in oxy-acetylene welding outfits.

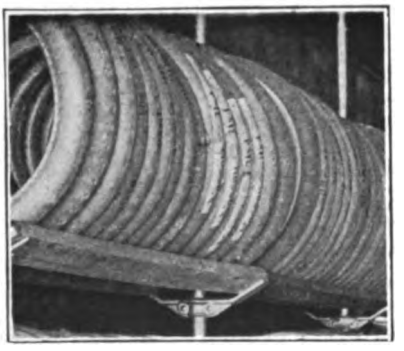
COX BRASS MANUFACTURING CO.

Manufacturers of Welding and Cutting Apparatus for *all* classes of work.

N. Pearl and Van Weert Streets
ALBANY, N. Y.

1733 Broadway New York City

2129 Michigan Ave. Chicago, Ill.



GIVES MORE POWER

Guaranteed non-injurious. Retails for $1.50 per can. One can contains sufficient material to treat 160 gallons of gasoline. Full directions with each can. If your dealer does not handle Elgin Motor Power we will send same express prepaid on receipt of $1.50 to any address in U. S. A.
We give one dealer in each town the exclusive rights to Elgin Motor Power sales, with liberal terms and generous discounts. Our National Advertising reaches more than 200,000 motorists. Write for full details.

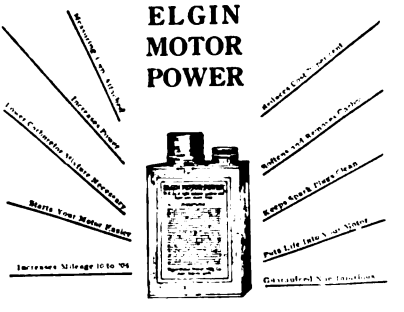
The Elgin Motor Power Mfg. Co.
CEDAR RAPIDS, IA.

Elgin's Easy Built Tire Racks Help the Sales of Tires

Show your stock—make it easy to select from. You can exhibit 480 tires on racks costing less than $35.000.
Easy Built Racks save space, are easily installed and don't collect dirt. They display the tires 100% better than any rack costing less than $35.00.
We sell the brackets for $9.00 per dozen. where. You can put the completed rack up in an hour or two. Six brackets are enough to support a rack holding 75 tires. We sell the brackets for $9 per dozen. Orders filled the day received.

ELGIN MOTOR POWER

Increases mileage from 10 to 20 per cent. Eliminates carbon, keeps the plugs clean.



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MACHINES (Continued)

BOLT POINTING MACHINES (Continued)

HOWARD Iron Works, Buffalo, N. Y. "Burdict."

LANDIS Machine Co., Waynesboro, Pa.

MERRIMAN—See Brown Co.

NATIONAL Machinery Co., Tiffin, O.

NILES-BEMENT-POND Co., New York, N. Y.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

WEBSTER & Perks Tool Co., Springfield, O.

BOLT THREADING MACHINES

ACME Machinery Co., Cleveland, O.

BROWN Co., H. B., East Hampton, Conn. "Merriman."

BURDICT—See Howard Iron Works.

FOOTE-BURT Co., Cleveland, O. "Reliance."

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

HERCULES—See Wells & Son Co.

HOWARD Iron Works, Buffalo, N. Y. "Burdict."

LANDIS Machine Co., Waynesboro, Pa.

MERRIMAN—See Brown Co.

NATIONAL Machinery Co., Tiffin, O.

NATIONAL-ACME Mfg. Co., Cleveland, O. (See page 441.)

NILES-BEMENT-POND Co., New York, N.Y.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

RELIANCE—See Foote-Burt Co.

UNIVERSAL Machine Co., Bowling Green, O.

WEBSTER & Perks Tool Co., Springfield, O.

WELLS & Son Co., F. E., Greenfield, Mass. "Hercules."

BORING MACHINES

(Horizontal)

BEAMAN & Smith Co., Providence, R. I.

ESPEN-LUCAS Machine Works, Philadelphia, Pa.

FOSDICK Machine Tool Co., Cincinnati, O.

GISHOLT Machine Co., Madison, Wis.

LUCAS Machine Tool Co., Cleveland, O. "Precision."

NILES-BEMENT-POND Co., New York, N. Y.

PRECISION—See Lucas Machine Tool Co.

UNIVERSAL Boring Machine Co., Hudson, Mass.

BORING MACHINES

(Vertical)

BAKER Bros., Toledo, O.

BEAMAN & Smith Co., Providence, R. I.

BULLARD Machine Tool Co., Bridgeport, Conn.

CINCINNATI Planer Co., Cincinnati, O.

COLBURN Machine Tool Co., Franklin, Pa.

FOOTE-BURT Co., Cleveland, O.

HOEFER Mfg. Co., Freeport, Ill.

KING Machine Tool Co., Cincinnati, O.

MOLINE Tool Co., Moline, Ill.

NILES-BEMENT-POND Co., New York, N. Y.

BUFFING AND POLISHING MACHINES

BENNETT-O'CONNELL Co., Chicago, Ill.

BLOUNT Co., J. G., Everett, Mass. (See page 713.)

BRIDGEPORT Safety Emery Wheel Co., Bridgeport, Conn.

BUILDERS Iron Foundry, Providence, R. I.

DIAMOND Machine Co., Providence, R. I.

GARDNER Machine Co., Beloit, Wis.

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 753.)

ST. LOUIS Machine Tool Co., St. Louis, Mo. "Western."

SIBLEY-HOUFLEY Machine Co., Detroit, Mich. "Garland."

SPRINGFIELD Mfg Co., Bridgeport, Conn.

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

TANITE Co., Stroudsburg, Pa.

VALLEY City Machine Works, Grand Rapids, Mich.

WEBSTER & Perks Tool Co., Springfield, O.

WESTERN—See St. Louis Machine Tool Co.

CAM CUTTING MACHINES

STANDARD Machinery Co., Auburn, R. I. (See page 713.)

CORE MAKING MACHINES

BROWN Specialty Machinery Co., Chicago, Ill. "Hammer."

DIAMOND Clamp & Flask Co., Richmond, Ind.

HAMMER—See Brown Specialty Machinery Co.

WADSWORTH Core Machine & Equipment Co., Akron, O.

CORE WIRE STRAIGHTENING AND CUTTING MACHINES

CLIMAX—See Worthington Pump & Machinery Corp.

GREGG Mfg. Co., Cleveland, O.

WORTHINGTON Pump & Machinery Corp., Cambridge, Mass. "Climax."

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Special Drop Forgings for Automobile Work

INGALLS-SHEPARD FORGING CO.

Office: McCormick Bldg., Michigan Ave. and Van Buren St., CHICAGO

Works: Harvey, Illinois

"JAMESTOWN"

The EFFICIENT Radiator

Because we give special consideration to the radiating requirements of every type of motor to be equipped, JAMESTOWN Radiators give complete satisfaction.

EFFICIENCY AND APPEARANCE

We build radiators of diagonal cellular type in various sizes and styles—the size fixed upon after a careful analysis of the radiation requirements of the particular motor the radiator is to work with—the style governed solely by the lines of the car. Efficiency and appearance are thus linked in the ultimate result.

QUALITY AND WEIGHT

We use the best material obtainable and construct the lightest radiator that will withstand severe treatment. Every radiator we build is tested with fifteen pounds air pressure under water before it passes inspection.

WORKMANSHIP

Skilled mechanics, long trained in their work, operating new machinery, build every part of every radiator that bears our name and we guarantee our product to meet every requirement of the most exacting car manufacturer.

SERVICE

Our experts on radiation will be glad to discuss your requirements with you and explain why our radiators will fill your demands.

We can be depended on to make deliveries according to contract.

JAMESTOWN CAR PARTS MFG. CO., Incorporated

JAMESTOWN :: :: :: NEW YORK

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MACHINES (Continued)

CRIMPING AND BEADING MACHINES

NIAGARA Machine & Tool Works, Buffalo, N. Y.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PETTINGELL Machine Co., Amesbury, Mass.

PEXTO—See Peck, Stow & Wilcox Co.

QUICKWORK—See Smith, H. Collier.

SMITH, H. Collier, Detroit, Mich. "Quickwork."

STOLL Co., D. H., Buffalo, N. Y.

YODER Co., C. M., Cleveland, O. (See page 721.)

CUTTING-OFF MACHINES

BROWN & Sharpe Mfg. Co., Providence, R. I.

DAVIS Machine Tool Co., Rochester, N. Y.

HURLBURT-ROGERS Machine Co., South Sudbury, Mass.

DOUBLE TREAD TIRE STITCHING MACHINES

BOSWORTH Machinery Co., Campbell, Boston, Mass.

LANDIS Machine Co., St. Louis, Mo.

DRILLING MACHINES

(See Drills)

ELECTRIC WELDING MACHINES

C. & C. Electric & Mfg. Co., Garwood, N. J.

GEUDER Paeschke & Frey Co., Milwaukee, Wis.

NATIONAL Electric Welder Co., Warren, O.

THOMSON Electric Welding Co., Lynn, Mass.

TOLEDO Electric Welder Co., Cincinnati, O.

UNIVERSAL Electric Welding Co., Long Island City, N. Y.

WINFIELD Electric Welding Machine Co., Warren, O. (See page 545.)

FENDER ROLLING MACHINES

YODER Co., C. M., Cleveland, O. (See page 721.)

FILING MACHINES

AMES & Co., B. C., Waltham, Mass.

COCHRANE-BLY Co., Rochester, N. Y.

EXTENSIVE Mfg. Co., New York, N. Y. "Simplex."

HARTFORD—See Robinson Tool Works.

ROBINSON Tool Works, Waterbury, Conn. "Hartford."

SIMPLEX—See Extensive Mfg. Co.

THURSTON Mfg. Co., Providence, R. I.

GEAR CUTTING MACHINES

BILGRAM Machine Works, Philadelphia, Pa.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CINCINNATI Gear Cutting Machine Co., Cincinnati, O.

FELLOWS Gear Shaper Co., Springfield, Vt.

FLATHER Mfg. Co., E. J., Nashua, N. H.

GARVIN Machine Co., New York, N. Y.

GLEASON Works, Rochester, N. Y.

GOULD & Eberhardt, Newark, N. J.

GRANT-LEES Gear Co., Cleveland, O.

LEES-BRADNER Co., Cleveland, O.

NEWARK Gear Cutting Machine Co., 67-69 Prospect St., Newark, N. J. (See page 823.)

SCHUCHARDT & Schutte, New York, N. Y. (Importers.)

SLOAN & Chace Mfg. Co., Newark, N. J.

STANDARD Mfg. Co., Bridgeport, Conn.

WHITON Machine Co., D. E., New London, Conn.

GEAR HOBBING MACHINES

ADAMS Co., Dubuque, Ia.

BARBER-COLMAN Co., Rockford, Ill.

GOULD & Eberhardt, Newark, N. J.

LEES-BRADNER Co., Cleveland, O.

MEISSELBACH-CATUCCI Mfg. Co., Newark, N. J.

NEWARK Gear Cutting Machine Co., 67-69 Prospect St., Newark, N. J. (See page 823.)

REYNOLDS Pattern & Machine Co., Moline, Ill.

SCHUCHARDT & Schutte, New York, N. Y. (Importers.)

GEAR TOOTH CHAMFERING MACHINES

CLIMAX Machinery Co., Indianapolis, Ind.

INGLE Corp., Rochester, N. Y.

SCHUCHARDT & Schutte, New York, N. Y. (Importers.)

HAIR PICKING MACHINES

ATLAS—See Curtis & Marble Machine Co.

CURTIS & Marble Machine Co., Worcester, Mass. "Atlas."

LOUNSBERY & Sons, G. H., Cincinnati, O.

PRIZE—See Willcomb Co.

WILLCOMB Co., Geo., Boston, Mass. "Prize."

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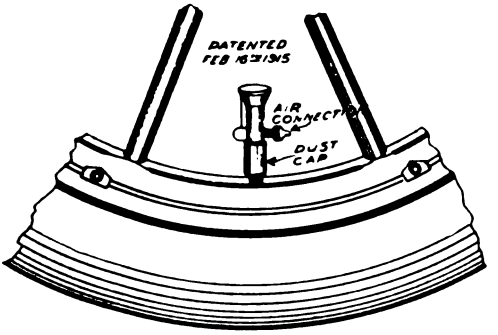


NO MORE BLOW-OUTS

WHY?

THE AUTOMATIC

SAFETY TIRE VALVE

REMOVES THE CAUSE AND GUARANTEES FIFTY PER CENT MORE MILEAGE

There is only one way that you can inflate your tires to a standard pressure and keep them there, and that is by installing the Automatic Safety Tire Valve.

Simple in construction. Cannot get out of order. The only proper way to determine inflation.

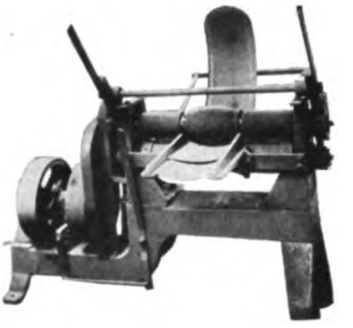
This is a guaranteed article, and we want accessory and garage dealers in every town. Write for circular and prices.

Sold in sets of four, $8.00.

Get your supply and reap the benefit of our advertising.

The Automatic Safety Tire Valve Co.

819 Free Press Bldg., Detroit, Mich.



"The Yoder Crown Fender Rolling Machine"

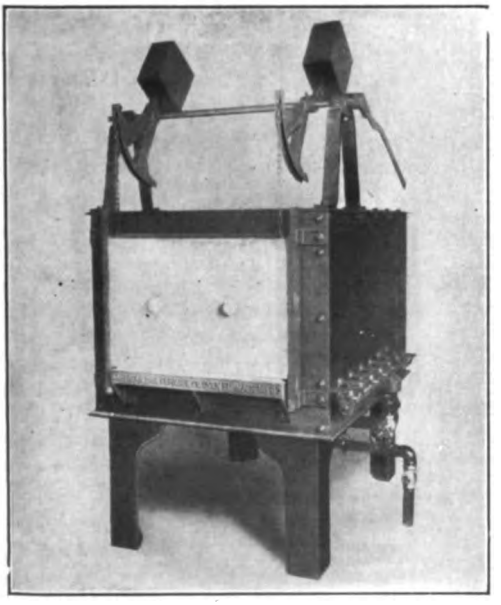
Your car is out of date if not equipped with Crown Fenders. The finest quality of fenders are rolled on this machine. It represents an enormous saving to the manufacturer.

We build a complete line of Sheet Metal Working Machinery. Our power Rotary Shears, Wiring and Beading Machines are unexcelled.

Remember the name "YODER" on the machines represents Quality and Service. It will pay you to write to us and get our prices and literature.

The C. M. Yoder Company

Cleveland, Ohio



Oven Furnace No. 93

For Annealing, Hardening or Case Hardening

American

Gas Furnaces

and

Heating Machines

Save Time, Labor, Lower the Cost and Improve Product

They increase your production capacity, making it uniform and less expensive. When equipped with our Automatic Heat Controller and Regulator, the temperatures are controlled to within five degrees Fahrenheit.

Our specialty is the use of ***Gas*** in Mechanical Heat-Treating Processes.

CATALOG SENT ON APPLICATION

American Gas Furnace Co.

24 JOHN ST., N. Y.

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MACHINES (Continued)

KEY SEATING MACHINES

BAKER Bros., Toledo, O.

BURR & Sons, John T., Brooklyn, N. Y.

DAVIS Machine Tool Co., Rochester, N. Y.

GIANT—See Mitts & Merrill.

LAPOINTE Machine Tool Co., Hudson, Mass.

MITTS & Merrill, Saginaw, Mich. "Giant."

NATIONAL Machine Tool Co., Cincinnati, O.

NILES-BEMENT-POND Co., New York, N. Y.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

LEATHER MEASURING MACHINES

NIGHTINGALE, J. E., Danvers, Mass.

TUFTING Machine Supply Co., Detroit, Mich.

TURNER Tanning Machinery Co., Peabody, Mass.

LOUVRE FORMING MACHINES

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill.
(See page 735.)

MARKING MACHINES

GORTON Machine Co., George, Racine, Wis.

METAL TESTING MACHINES

OLSEN Testing Machine Co., Tinius, Philadelphia, Pa.

MILLING MACHINES

ADAMS Co., Dubuque, Ia.

BEAMAN & Smith Co., Providence, R. I.

BECKER Milling Machine Co., Hyde Park, Mass.

BRIGGS—See Gooley & Edlund.

BROWN & Sharpe Mfg. Co., Providence, R. I.

CARTER & Hakes Machine Co., Winsted, Conn.

CINCINNATI Milling Machine Co., Cincinnati, O.

FOSDICK Machine Tool Co., Cincinnati, O.

FOX Machine Co., Grand Rapids, Mich.

GARVIN Machine Co., New York, N. Y.

GOOLEY & Edlund, Cortland, N. Y. "Briggs."

HENDEY Machine Co., Torrington, Conn.

INGERSOLL Milling Machine Co., Rockford, Ill.

KEARNEY & Trecker Co., Milwaukee, Wis. "Milwaukee."

KEMPSMITH Mfg. Co., Milwaukee, Wis.

KNIGHT Machinery Co., W. B., St. Louis, Mo.

LE BLOND Machine Tool Co., R. K., Cincinnati, O.

LUCAS Machine Tool Co., Cleveland, O. "Precision."

MILWAUKEE—See Kearney & Trecker Co.

NILES-BEMENT-POND Co., New York, N. Y.

OESTERLEIN Machine Co., Cincinnati, O. "Ohio."

OHIO—See Oesterlein Machine Co.

PRATT & Whitney Co., Hartford, Conn.
(See page 661.)

PRECISION—See Lucas Machine Tool Co.

ROCKFORD Machine Tool Co., Rockford, Ill.

ROCKFORD Milling Machine Co., Rockford, Ill.

SLOAN & Chace Mfg. Co., Newark, N. J.

STEPTOE Co., John, Cincinnati, O.

THURSTON Mfg. Co., Providence, R. I.

VALLEY City Machine Works, Grand Rapids, Mich.

VAN NORMAN Machine Tool Co., Springfield, Mass.

WHITNEY Mfg. Co., Hartford Conn.
(See page 723.)

MOTOR DECARBONIZING MACHINES

(See also Compounds, Carbon; also Removers, Carbon)

ASHTON, Laird & Co., New York, N. Y. "Astra."

ASTRA—See Ashton, Laird & Co.

AUTO Gas Light Co., Hazelton, Pa. "M-E."

BATEMAN Bros., Centerville, Ia. "O-So-Easy."

BISHOP-BABCOCK-BECKER Co., Cleveland, O. "Eureka."

CHAMPION—See Cleveland Faucet Co.

CLEVELAND Faucet Co., Cleveland, O. "Champion."

COX Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
(See page 717.)

DYER Co., G. H., Cambridge, Mass.

EUREKA—See Bishop-Babcock-Becker Co.

FERRIER Mfg. Co., G. F., Pittsburg, Pa.

GENERAL Welding Co., Hoboken, N. J. "Novel."

HILT Co., R., Boston, Mass.

IMPERIAL Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill.
(See page 869.)

M-E—See Auto Gas Light Co.

MANUFACTURERS Welding Co., Brooklyn, N. Y. "U. O. C."

MESSER & Co., Philadelphia, Pa.

NOVEL—See General Welding Co.

O-SO-EASY—See Bateman Bros.

OXWELD Acetylene Co., Chicago, Ill.

OXYGEN Decarbonizer Co., Albion, Mich.

OZO Co., Boston, Mass.

PREST-O-CARBON—See Prest-O-Lite Co.

PREST-O-LITE Co., 1400 Speedway, Indianapolis, Ind. "Prest-O-Carbon."
(See page 553.)

RICE & Dayton Mfg. Co., Cedar Falls, Ia.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

TOLMAN Mfg. Co., Boston, Mass.

U. O. C.—See Manufacturers Welding Co.

VULCAN Brazing & Machine Co., Philadelphia, Pa.

VULITE Chemical Co., Boston, Mass.

WATERHOUSE Welding Co., Boston, Mass.

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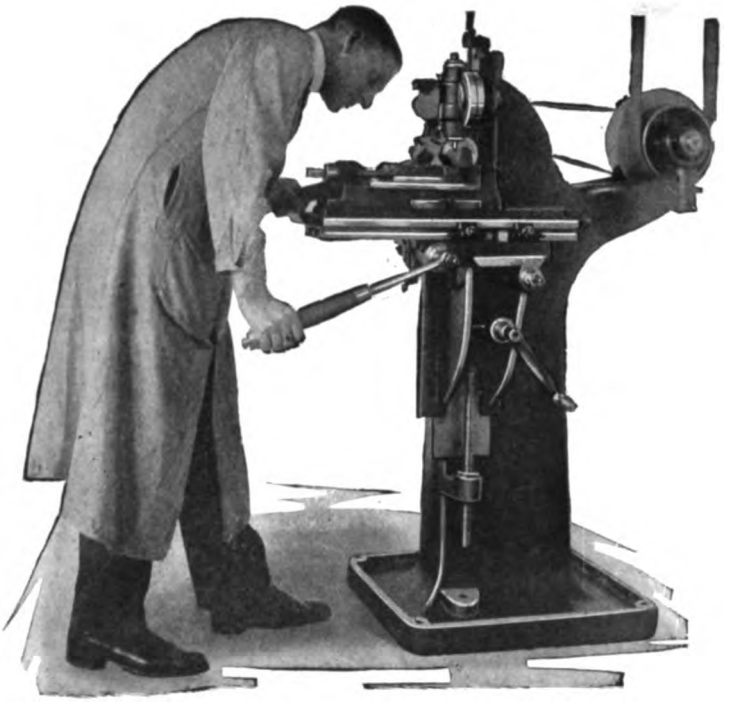

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MACHINES (Continued)

NUT TAPPING MACHINES

ACME Machinery Co., Cleveland, O.

BROWN Co., H. B., East Hampton, Conn.

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

HOWARD Iron Works, Buffalo, N. Y. "Schlenker."

LANDIS Machine Co., Waynesboro, Pa.

NATIONAL-ACME Mfg. Co., Cleveland, O. (See page 441.)

NILES-BEMENT-POND Co., New York, N. Y.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

SCHLENKER—See Howard Iron Works.

WEBSTER & Perks Tool Co., Springfield, O.

WELLS & Son Co., F. E., Greenfield, Mass.

PICKLING MACHINES

MESTA Machine Co., Pittsburgh, Pa.

PISTON RING MACHINES

(Semi-Automatic)

GRIDLEY—See Windsor Machine Co.

WINDSOR Machine Co., Windsor, Vt. "Gridley."

POLISHING MACHINES

(See Machines, Buffing and Polishing)

PORTABLE CYLINDER, REBORING AND REGRINDING MACHINES

STORM & O'Hair Co., Thompson, Ia.

PROFILING MACHINES

BECKER Milling Machine Co., Hyde Park, Mass.

GARVIN Machine Co., New York, N. Y.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

RIVETING MACHINES

CINCINNATI Pulley Machinery Co., Cincinnati, O.

GRANT Mfg. & Machine Co., Bridgeport, Conn.

NEW Doty Mfg. Co., Janesville, Wis.

NILES-BEMENT-POND Co., New York, N. Y.

PAWTUCKET Mfg. Co., Pawtucket, R. I.

SHUSTER Co., F. B., New Haven, Conn.

TOWNSEND Mfg. Co., H. P., Hartford, Conn.

SAND BLAST MACHINES

AMERICAN Blast Co., New York, N. Y.

BETTON, J. M., New York, N. Y. "Drucklieb."

BROWN Specialty Machinery Co., Chicago, Ill.

BUCKEYE—See Macleod Co.

CURTIS Pneumatic Machinery Co., St. Louis, Mo.

DANIC—See Nichols Iron Works.

DRUCKLIEB—See Betton, J. M.

MACLEOD Co., Walter, Cincinnati, O. "Buckeye."

MOTT Sand Blast Mfg. Co., New York, N. Y.

NIAGARA Devices, Buffalo, N. Y.

NICHOLS Iron Works, D. M., New York, N. Y. "Danic."

PANGBORN Corp., Hagerstown, Md.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. "Paxson-Warren." (See page 725.)

PAXSON-WARREN—See Paxson Co.

SLY Mfg. Co., W. W., Cleveland, O.

SUPERIOR Machine Tool Co., Kokomo, Ind.

TILGHMAN-BROOKSAND Sand Blast Co., Philadelphia, Pa.

SAW SHARPENING MACHINES

COCHRANE-BLY Co., Rochester, N. Y.

HUNTER Saw & Machine Co., Pittsburg, Pa.

NUTTER & Barnes Co., Hinsdale, N. H.

SCREW MACHINES

(Automatic)

ACME—See National-Acme Mfg. Co.

AUTOMATIC Machine Co., Bridgeport, Conn

BROWN & Sharpe Mfg. Co., Providence, R. I.

CHICAGO Automatic Machine Co., Chicago, Ill.

CINCINNATI Automatic Machine Co. (Oakley), Cincinnati, O. "Hayden." (See page 571.)

CLEVELAND Automatic Machine Co., Cleveland, O.

DAVIS Sewing Machine Co., Dayton, O. "Lester."

DAVENPORT Machine Tool Co., New Bedford, Mass.

FOSTER Machine Co., Elkhart, Ind.

GRIDLEY—See Windsor Machine Co.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. (See page 383.)

HAYDEN—See Cincinnati Automatic Machine Co.

LESTER—See Davis Sewing Machine Co.

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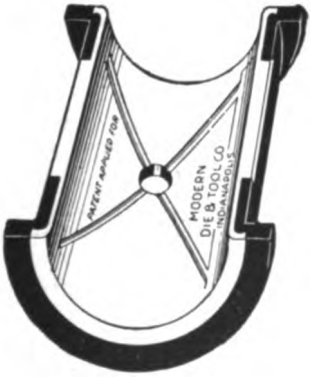

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MACHINES (Continued)

SCREW MACHINES (Continued)

NATIONAL-ACME Mfg. Co., Cleveland, O. "Acme." (See page 441.)

NEW BRITAIN Machine Co., 10 Bigelow St., New Britain, Conn. (See page 753.)

PEERLESS Automatic Machine Co., Cleveland, O.

POTTER & Johnston Machine Co., Pawtucket, R. I.

TOWNSEND Mfg. Co., H. P., Hartford, Conn.

WINDSOR Machine Co., Windsor, Vt. "Gridley."

SCREW MACHINES

(Hand)

ACME Machine Tool Co., Cincinnati, O. (See page 571.)

BARDONS & Oliver, Cleveland, O.

DRESSES Machine Tool Co., Cincinnati, O.

FOSTER Machine Co., Elkhart, Ind.

GARVIN Machine Co., New York, N. Y.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

WARNER & Swasey Co., Cleveland, O.

SPRING COILING MACHINES

BAIRD Machine Co., Bridgeport, Conn.

COULTER & McKenzie Machine Co., Bridgeport, Conn.

GARVIN Machine Co., New York, N. Y.

HOEFER—See Wells Co.

SLEEPER & Hartley, Worcester, Mass.

WELLS Co., Frank L., Kenosha, Wis. "Hoefer."

SPRING TESTING MACHINES

COULTER & McKenzie Machine Co., Bridgeport, Conn.

OLSEN Testing Machine Co., Philadelphia, Pa.

TAPPING MACHINES

BAKER Bros., Toledo, O.

BURKE Machine Tool Co., Conneaut, O.

GARVIN Machine Co., New York, N. Y.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. (See page 383.)

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

ST. LOUIS Machine Tool Co., St. Louis, Mo.

TIRE BANDAGE WRAPPING MACHINES

MILLER, Chas. E., Anderson, Ind.

PIERCE Wrapping Machine Co., Chicago, Ill.

ROSSMAN, Roy G., Seattle, Wash.

TOP BOW DRESSING MACHINES

BUOB & Scheu, Cincinnati, O. "Peerless."

PEERLESS—See Buob & Scheu.

UPHOLSTERY BUTTON MACHINES

HANDY—See Tufting Machine Supply Co.

LOUNSBERY & Sons, G. H., Cincinnati, O.

RELIABLE—See Tufting Machine Supply Co.

TUFTING Machine Supply Co., Detroit, Mich. "Handy," "Reliable."

UPHOLSTERY TUFTING MACHINES

BUSER-POSTON Tufting Machine Co., Chillicothe, O. (See page 821.)

NOVELTY—See Tufting Machine Supply Co.

TUFTING Machine Supply Co., Detroit, Mich. "Novelty."

VALVE SEATING MACHINES

(For Valve Seating Tools—See Tools, Valve Grinding)

AUTOMATIC Valve-Seating Machinery Co., Sioux City, Ia.

FOOTE-BURT Co., Cleveland, O.

TAYLOR & Fann Co., Hartford, Conn.

WIRE SPOKE SWAGING MACHINES

LANGELIER Mfg. Co., Providence, R. I.

WOOD BENDING MACHINES

DEFIANCE Machine Works, Defiance, O.

FAY & Egan Co., J. A., Cincinnati, O.

WOOD BORING MACHINES

AJAX Mfg. Co., Pittsburg (N. S.), Pa.

AMERICAN Wood Working Machinery Co., Rochester, N. Y.

BENTEL & Margedant Co., Hamilton, O.

CORDESMAN, Meyer & Co., Cincinnati, O.

CORDESMAN-RECHTIN Co., Cincinnati, O.

DEFIANCE Machine Works, Defiance, O.

FAY & Egan Co., J. A., Cincinnati, O.

GREENLEE Bros. & Co., Rockford, Ill.

JONES Superior Machine Co., Chicago, Ill.

KANE & Roach, Syracuse, N. Y.

OBER Mfg. Co., Chagrin Falls, O.

OLIVER Machinery Co., Grand Rapids, Mich.

POWER & Co., L., Philadelphia, Pa.

PRYIBIL Machine Co., P., New York, N. Y.

SMITH Machine Co., H. B., Smithville, N. J.

VALLEY City Machine Works, Grand Rapids, Mich.

WOOD MORTISING AND TENONING MACHINES

AMERICAN Wood Working Machinery Co., Rochester, N. Y.

CORDESMAN-RECHTIN Co., Cincinnati, O.

DEFIANCE Machine Works, Defiance, O.

FAY & Egan Co., J. A., Cincinnati, O.

GREENLEE Bros. & Co., Rockford, Ill.

OLIVER Machinery Co., Grand Rapids, Mich.

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MALLETS

WOODEN MALLETS

DELPHOS Mfg. Co., Delphos, O.
HELLENBERG Co., J. B., Coldwater, Mich.
O'NEIL, Jr., J. H., Pawtucket, R. I.
PIQUA Handle & Mfg. Co., Piqua, O.
UNION Hardware Co., Torrington, Conn.

MANDRELS

EXPANDING MANDRELS

ALERT Tool Co., Philadelphia, Pa.
CHAMPION—See Western Tool & Mfg. Co.
LE COUNT, Wm. G., South Norwalk, Conn.
McCROSKY Reamer Co., Meadville, Pa.
MORSE Twist Drill & Machine Co., New Bedford, Mass.
NICHOLSON & Co., W. H., Wilkes-Barre, Pa.
WESTERN Tool & Mfg. Co., Springfield, O. "Champion."

MATERIALS

CASE HARDENING MATERIALS

(See Compounds, Case Hardening)

METERS

CUT METERS

AMERICAN Ever Ready Works, Long Island City, N. Y. "Eveready."
EVEREADY—See American Ever Ready Works.
STEWART-WARNER Speedometer Corp., Chicago, Ill. "Warner." (See page 461.)
WARNER—See Stewart-Warner Speedometer Corp.

GASOLINE OR OIL METERS

BOWSER & Co., S. F., Fort Wayne, Ind.
BUFFALO Meter Co., Buffalo, N.Y. "Niagara."
HYDRAULIC Oil Storage & Engineering Co., New York, N. Y.
NIAGARA—See Buffalo Meter Co.
TOKHEIM Mfg. Co., Cedar Rapids, Ia.

MICROMETERS

MICROMETER CALIPERS

BROWN & Sharpe Mfg. Co., Providence, R. I.
COLUMBIA—See Smith, E. G.
GOODELL-PRATT Co., Greenfield, Mass.
SLOCOMB Co., J. T., Providence, R. I.
SMITH, E. G., Tampa, Fla. "Columbia."
STARRETT Co., L. S., Athol, Mass.

MOLDS

SOFT HAMMER MOLDS

HORAT, J., Lafayette, Ind.

TIRE VULCANIZING MOLDS AND CORES

AKRON Rubber Mold & Machine Co., Akron, O. (See page 559.)
BRIDGEWATER Machine Co., Akron, O.
JONES & Kuhlke, Akron, O.
MILLER, Chas. E., Anderson, Ind.
MILWAUKEE Auto Specialty Co., Milwaukee, Wis.
WILLIAMS Foundry & Machine Co., Akron, O.

OVENS

CORE BAKING OVENS

BLODGETT Co., G. S., Burlington, Vt.
CALUMET Foundry Equipment Co., Harvey, Ill.
GOETZ Co., Chicago, Ill.
HILL & Griffith Co., Cincinnati, O.
MILLETT Core Oven Co., Springfield, Mass.
MONARCH Engineering & Mfg. Co., Baltimore, Md.
OVEN Equipment & Mfg. Co., New Haven, Conn.
ROCKWELL Co., W. S., New York, N. Y.
WADSWORTH Core Machine & Equipment Co., Akron, O.
WHITING Foundry Equipment Co., Harvey, Ill.
YOUNG Bros Co., Detroit, Mich. (See page 729.)

ENAMELING OVENS

AMERICAN Enamel Co., Providence, R. I. "Mascot."
CULLEN-ATKINSON Co., Hartford, Conn.
MASCOT—See American Enamel Co.
MONARCH Engineering & Mfg. Co., Baltimore, Md.
OVEN Equipment & Mfg. Co., New Haven Conn.
ROCKWELL Co., W. S., New York, N. Y.
YOUNG Bros Co., Detroit, Mich. (See page 729.)

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PAPER

EMERY AND SAND PAPER

AMERICAN Glue Co., Boston, Mass. "Union," "New England," "Boston."

ARMOUR & Co., Chicago, Ill.

BAEDER, Adamson & Co., Philadelphia, Pa.

BARTON & Son Co., H. H., Philadelphia, Pa.

BEHR & Co., Herman, New York, N. Y. "Brooklyn."

BOSTON—See American Glue Co.

BROOKLYN—See Behr & Co.

CARBORUNDUM Co., Niagara Falls, N. Y.

MANNING Sand Paper Co., Troy, N. Y.

MINNESOTA Mining & Mfg. Co., Chicago, Ill.

NEW ENGLAND—See American Glue Co.

UNION—See American Glue Co.

U. S. Sand Paper Co., Williamsport, Pa.

WAUSAU Abrasives Co., Wausau, Wis. Wausite."

WAUSITE—See Wausau Abrasives Co.

PLANERS

METAL PLANERS

AMERICAN Tool Works Co., Cincinnati, O.

BARTLETT, Edwin E., Boston, Mass. "Federal."

CINCINNATI Planer Co., Cincinnati, O.

CINCINNATI Shaper Co., Cincinnati, O.

FEDERAL—See Bartlett, Edwin E.

GRAY Co., G. A. Cincinnati, O.

HAMILTON Machine Tool Co., Hamilton, O.

NILES-BEMENT-POND Co., New York, N. Y. "Pond."

OHIO Machine Tool Co., Kenton, O.

POND—See Niles-Bement-Pond Co.

PUTNAM Machine Co., Fitchburg, Mass.

ROCKFORD Machine Tool Co., Rockford, Ill.

STAPF & Co., John B., Dunkirk, N. Y.

WHITCOMB-BLAISDELL Machine Tool Co., Worcester, Mass.

WOODWARD & Powell Planer Co., Worcester, Mass.

WOOD PLANERS

AMERICAN Wood Working Machinery Co., Rochester, N. Y.

BENTEL & Margedant Co., Hamilton, O.

C. A. S. Sales Co., 799-801 Woodward Ave., Detroit, Mich. (Distributors.) (See pages 300 and 301.)

CONNELL & Dengler Machine Co., Rochester, N. Y.

CORDESMAN, Meyer & Co., Cincinnati, O.

CORDESMAN-RECHTIN Co., Cincinnati, O.

CRESCENT Machine Co., Leetonia, O.

DEFIANCE Machine Works, Defiance, O.

FALLS Machine Co., Sheboygan Falls, Wis. (See pages 300 and 301.)

FAY & Egan Co., J. A., Cincinnati, O.

GREENLEE Bros. & Co., Rockford, Ill.

HALL & Brown Woodworking Machine Co., St. Louis, Mo.

JONES Superior Machine Co., Chicago, Ill.

KANE & Roach, Syracuse, N. Y.

OLIVER Machinery Co., Grand Rapids, Mich

PORTER Machinery Co., C. O., Grand Rapids, Mich.

POWER & Co., L., Philadelphia, Pa.

PRYIBIL Machine Co., P., New York, N. Y.

SCHNEIDER & Goosman Machine Co., Cincinnati, O.

SMITH Machine Co., H. B., Smithville, N. J.

WHITNEY & Son, Baxter D., Winchendon, Mass.

PLANES

WOODWORKERS PLANES

BAILEY—See Stanley Rule & Level Co.

BEDROCK—See Stanley Rule & Level Co.

CHAPIN-STEVENS Co., Pine Meadow, Conn

GAGE Tool Co., Vineland, N. J.

MACK & Co., Rochester, N. Y.

OHIO Tool Co., Charleston, W. Va.

SARGENT & Co., New Haven, Conn.

STANLEY Rule & Level Co., New Britain, Conn. "Bailey," "Bedrock."

PLATES

FOUNDRY RAPPING PLATES

ACME—See Everett & Son.

BENSKIN Mfg. Co., Canton, O. "Perfect."

CLEVELAND Galvanizing Works Co., Cleveland, O.

DIAMOND Clamp & Flask Co., Richmond, Ind.

EVERETT & Son, A., Auburn, N. Y. "Acme." "Fraser."

FRASER—See Everett & Son.

FRASER—See Paxson Co.

HILL & Griffith Co., Cincinnati, O.

OLIVER Machinery Co., Grand Rapids, Mich.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. "Fraser." (See page 725.)

PERFECT—See Benskin Mfg. Co.

TIMMIS & Clissold, Bound Brook, N. J.

SCREW PLATES

(See Taps and Dies)

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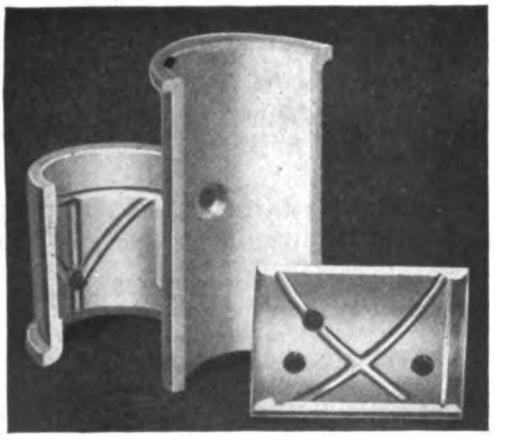

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PLIERS

COMBINATION PLIERS

AMERICAN Forge & Machine Co., Canton, O.

ATHOL Machine Co., Athol, Mass.

BARCALO Mfg. Co., Buffalo, N. Y.

BERGMAN Tool Mfg. Co., Buffalo, N. Y.

BERNARD—See Scholhorn Co.

BILLINGS & Spencer Co., Hartford, Conn. "Hayden."

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BUFFUM Tool Co., Louisiana, Mo.

CINCINNATI Tool Co., Norwood, O. "Hargrave."

CRESCENT Tool Co., Jamestown, N. Y. "Simplex."

CRONK & Carrier Mfg. Co., Elmira, N. Y.

CURRIER-KOETH Mfg. Co., Coudersport, Pa. "K. I. T."

DREADNAUGHT—See Kraeuter & Co.

ERIE Tool Works, Erie, Pa.

GITTATIT—See Smith & Co.

GOODELL-PRATT Co., Greenfield, Mass.

HANDEE—See Racine Handy Mfg. Co.

HARGRAVE—See Cincinnati Tool Co.

HAYDEN—See Billings & Spencer Co.

HERBRAND Co., Fremont, O. (See page 679.)

HJORTH & Co., Wm., Jamestown, N. Y.

K. I. T.—See Currier-Koeth Mfg. Co.

KILBORN & Bishop Co., New Haven, Conn.

KRAEUTER & Co., Newark, N. J. "Dreadnaught," "Victor."

McKAIG Drop Forge Co., Buffalo, N. Y.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

OSBORNE & Co., C. S., Harrison, N. J.

OSWEGO Tool Co., Oswego, N. Y.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

RACINE Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee." (See page 621.)

REDD Mfg. Co., Erie, Pa.

S. & I. Co., Springfield, Mass.

SCHOLHORN Co., Wm., New Haven, Conn. "Bernard."

SHARK—See Wakefield Mfg. Co.

SIMPLEX—See Crescent Tool Co.

SMITH & Co., H. D., Plantsville, Conn. "Gittatit."

STARRETT Co., L. S., Athol, Mass.

SYRACUSE Twist Drill Co., Syracuse, N. Y.

VICTOR—See Kraeuter & Co.

VLCHEK Tool Co., Cleveland, O.

WAKEFIELD Mfg. Co., Wakefield, Neb. "Shark."

WEST Haven Mfg. Co., New Haven, Conn.

WORDEN, E. M., Ladysmith, Wis.

GAS PLIERS

(See Pliers, Combination)

POLISHERS

ELECTRIC PORTABLE POLISHERS

(See Drills, Electric Portable)

POSTS

TOOL POSTS

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)

O. K. Tool Holder Co., Shelton, Conn.

PRESSES

ARBOR PRESSES

ATLAS Press Co., Kalamazoo, Mich. "Eames."

BARNES Co., W. F. & John, Rockford, Ill.

BARTLETT, Edwin E., Boston, Mass. "Greenerd."

D. P.—See Pruyn Co.

EAMES—See Atlas Press Co.

GEIER Co., P. A., Cleveland, O.

GREENERD—See Bartlett, Edwin E.

LEWISTON Motors, Lewiston, Me. "Whitney."

LOURIE Mfg. Co., Springfield, Ill.

LUCAS Machine Tool Co., Cleveland, O.

McGREGOR—See U. S. Auto Bumper Co.

MANLEY—See United Engine & Mfg. Co.

MILLS Mfg. Co., Sabina, O.

MYERS Machine Tool Co., Columbia, Pa.

NILES-BEMENT-POND Co., New York, N. Y.

POST Garage & Repair Shop, Amos, Catskill, N. Y.

PRUYN Co., David H., New York, N. Y. "D. P."

U. S. Auto Bumper Co., Chicago, Ill. "McGregor."

UNITED Engine & Mfg. Co., Hanover, Pa. "Manley."

WEAVER Mfg. Co., Springfield, Ill.

WHITNEY—See Lewiston Motors.

WILMARTH & Morman Co., Grand Rapids, Mich.

BENCH STRAIGHTENING PRESSES

CHAMBERSBURG Engineering Co., Chambersburg, Pa.

COREY—See Steel Specialties Co.

GEIER Co., P. A., Cleveland, O.

LITTLE GIANT—See Noyes & Co.

NOYES & Co., B. B., Greenfield, Mass. "Little Giant."

SPRINGFIELD Machine Tool Co., Springfield, O.

STEEL Specialties Co., Boston, Mass. "Corey."

BROACHING PRESSES

BLISS Co., E. W., Brooklyn, N. Y.

BURR & Sons, J. T., Brooklyn, N. Y.

CHAMBERSBURG Engineering Co., Chambersburg, Pa.

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NOGLARE PRISMATIC LENSES
for
Automobile Headlights
Manufactured by
CORNING GLASS WORKS

Conforming to the regulations or approved by the authorities of the States of Massachusetts, New Jersey and cities having local motor-lighting ordinances, notably Chicago, Milwaukee and many others.

ALL THE LIGHT WHERE YOU WANT IT—ALONG THE ROAD,
NOT IN THE OTHER FELLOW'S EYES

CORNING LENSES are the result of the experience, and are backed by the guarantee of the World's largest manufacturer of glass for headlight and railroad signal service. CORNING LENSES are made either in clear glass or in a special "Noglare Tint" (light yellow)—the latter being preferable because it affords a light of much higher penetration in fog, dust and smoke.

NOGLARE PRISMATIC LENSES

ARE CORRECT—Scientifically DEPENDABLE—Every minute
EFFECTIVE—Practically SAFE—Under all conditions
SIMPLE—INEXPENSIVE—DURABLE

CORNING LENSES are covered by U. S. Patents, issued, allowed and pending. All infringements will be vigorously prosecuted.

Diameter	Clear	Noglare Yellow
7½" to 8½"	$2.50 per pair	$3.50 per pair
8⅝" to 10½"	3.00 " "	4.00 " "
10⅝" to 11¾"	4.00 " "	5.00 " "
5" to 6⅞" (motorcycle)	.80 each	1.00 each

A Liberal Discount is allowed to the Trade

DISTRIBUTORS:
Prismatic Lens Co. of New England, Osgood Bldg., Worcester, Mass.
Prismatic Lens Co. of New Jersey, 730 Grand St., Hoboken, N. J.
F. A. Hardy & Co., 10 S. Wabash Ave., Chicago, Ill.
Dealers outside of New England, New Jersey and Illinois write direct to

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For the Convenience of the

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Parts Stations, Service Stations and Branches have been established in the following motoring centers:

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Cape Town, S. A.	Cincinnati, O.	Boston, Mass.
Columbia, S. C.	Cleveland, Ohio.	Chicago, Ill.
Dallas, Texas.	Columbus, Ohio.	Detroit, Mich.
El Paso, Texas.	Des Moines, Iowa.	Kansas City, Mo.
Houston, Texas.	Denver, Colo.	London, England.
Jackson, Miss.	Indianapolis, Ind.	Los Angeles, Calif.
Memphis, Tenn.	New Orleans, La.	Minneapolis, Minn.
Portland, Me.	Omaha, Nebr.	New York, N. Y.
Portland, Ore.	Oklahoma City, Okla.	San Francisco, Calif.
Providence, R. I.	Philadelphia, Pa.	
Rochester, N. Y.	Pittsburg, Pa.	
San Antonio, Texas.	Seattle, Wash.	
Soerabaia, D. E. I.	St. Louis, Mo.	
Spokane, Wash.	Syracuse, N. Y.	
Sydney, Australia.		
Wellington, N. Z.		

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Remy Electric Company
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Engineering Laboratories: DETROIT, MICHIGAN

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PRESSES (Continued)

BROACHING PRESSES (Continued)

CONSOLIDATED Press & Tool Co., Hasting, Mich.

LAPOINTE Co., J. N., New London, Conn.

LAPOINTE Machine Tool Co., Hudson, Mass.

PERKINS Machine Co., Warren, Mass.

STANDARD Machinery Co., Auburn, R. I. (See page 713.)

WATSON-STILLMAN Co., New York, N. Y.

POWER PRESSES

ADRIANCE Machine Works, Brooklyn, N. Y.

AMS Machine Co., Max, Mt. Vernon, N. Y.

ATLAS Machine Co., Waterbury, Conn.

BAIRD Machine Co., Bridgeport, Conn.

BERTSCH & Co., Cambridge City, Ind.

BLISS Co., E. W., Brooklyn, N. Y.

BRISTOL—See Garrigus Machine Co.

CLEVELAND Machine & Mfg. Co., Cleveland, O.

CLEVELAND Punch & Shear Works Co., Cleveland, O.

CONSOLIDATED Press & Tool Co., Hasting, Mich.

COULTER & McKenzie Machine Co., Bridgeport, Conn.

FERRACUTE Machine Co., Bridgeton, N. J.

GARRIGUS Machine Co., C. G., Bristol, Conn. "Bristol."

HIBBARD Mfg. Co., Wm. H., Brooklyn, N. Y.

LA SALLE Machine & Tool Co., La Salle, Ill.

LEFFLER & Co., Chas., Brooklyn, N. Y.

LOSHBOUGH-JORDAN Tool & Machine Co., Elkhart, Ind.

MANVILLE Machine Co., E. J., Waterbury, Conn.

MASSILLON Foundry & Machine Co., Massillon, O.

MICHIGAN Press Co., Ypsilanti, Mich.

NIAGARA Machine & Tool Works, Buffalo, N. Y.

NILES-BEMENT-POND Co., New York, N. Y.

PERKINS Machine Co., Warren, Mass.

ROCKFORD Iron Works, Rockford, Ill.

SPRINGFIELD Machine Tool Co., Springfield, O.

STANDARD Machinery Co., Auburn, R. I. (See page 713.)

STOLL Co., D. H., Buffalo, N. Y.

SWAINE Mfg. Co., Fred J., St. Louis, Mo.

TOLEDO Machine & Tool Co., Toledo, O.

V. & O. Press Co., Brooklyn, N. Y.

WATERBURY Farrell Foundry & Machine Co., Waterbury, Conn.

WILLARD Machine & Tool Co., Cincinnati, O.

ZEH & Hahnemann Co., Newark, N. J.

PULLERS

COTTER PIN PULLERS

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BUFFUM Tool Co., Louisiana, Mo.

CARVER Tool Works, Spring Valley, N. Y.

CLINTON Machine Works, Clinton, Mass.

E-Z—See Syracuse Wrench Co.

KRAEUTER & Co., Newark, N. J.

MARCY Tool Works, Putnam, Conn.

MOSSBERG Co., Frank, Attleboro, Mass. (See page 773.)

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo. (See page 747.)

NOONAN Tool & Machine Works, A. S., Rome, N. Y.

OSBORNE & Co., C. S., Harrison, N. J.

S. & I. Co., Springfield, Mass.

STORTZ & Son, John, Philadelphia, Pa.

SYRACUSE Twist Drill Co., Syracuse, N. Y.

SYRACUSE Wrench Co., Syracuse, N. Y. "E-Z." (See page 765.)

VAUGHAN & Bushnell Mfg. Co., Chicago, Ill.

VICHEK Tool Co., Cleveland, O.

GEAR AND WHEEL PULLERS

BICKWELL Mfg. & Supply Co. Janesville, Wis.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

COLLISON, George A., Burlington, Vt.

CRANE Puller Co., Arlington, Mass.

EASY—See Tucker Tool & Machine Co.

KERSCHBAUM, M. E., New York, N. Y.

LITTLE GIANT—See Premier Electric Co.

POLSON Mfg. Co., Buffalo, N. Y.

PREMIER Electric Co., 4053 Ravenswood Ave., Chicago, Ill. "Little Giant." (See page 559.)

TUCKER Tool & Machine Co., New York, N. Y. "Easy."

PUMPS

GARAGE PUMPS AND AIR COMPRESSORS

A. B. C.—See Artizan Brass Co.

AALDING Mfg. Co., Manchester, N. H. (See page 739.)

AKRON-WILLIAMS—See Williams Foundry & Machine Co.

ALLIS-CHALMERS Mfg. Co., Milwaukee, Wis.

AMERICAN Electric Air Pump Co., Pittsburg, Pa.

AMERICAN Steam Pump Co., Battle Creek, Mich.

APEX Electric Mfg. Co., Chicago, Ill.

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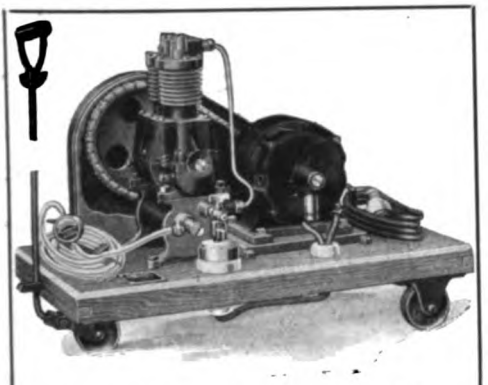

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Portable outfit for heavy duty use in public or private garages. Two-cylinder air-cooled pump driven by 1/4 H.P. electric motor with silent chain drive. Complete with 10 ft. electric wire and attachment plug, 12 ft. hose, gauge, tire valve connection. Fully guaranteed for one year. Price, complete, $60.00. Write for full information.

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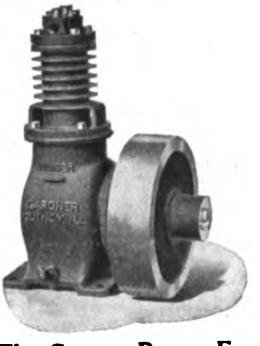
ERIE, PA., U. S. A.

GARDNER

"GEE GEE" AIR COMPRESSOR



The Garage Pump For

Service, Efficiency Dependability

Entirely enclosed, dust and dirt proof, and automatically splash lubricated. Its high speed gives it larger capacity than any other pump of same size cylinder. If you want maximum service at minimum cost investigate the "Gee Gee." Ask for circular AC-11.

The Gardner Governor Company
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Singer Bldg., New York City
Fisher Bldg., Chicago
5 First St., San Francisco

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PUMPS (Continued)

GARAGE PUMPS AND AIR COMPRESSORS (Continued)

ARTIZAN Brass Co., Chicago, Ill. "A. B. C."

AU-TO Compressor Co., Wilmington, O.

BEACH-RUSS Co., New York, N. Y.

BESSEMER Gas Engine Co., Grove City, Pa.

BINKS—See Star Brass Works.

BISHOP-BABCOCK-BECKER Co., Cleveland, O. "Eureka."

BLACK & Decker Mfg. Co., 105 S. Calvert St., Baltimore, Md. "Lectroflater." (See page 737.)

BLAISDELL Machine Co., Bradford, Pa.

BROWN Beer Pump Co., E. R., Boston, Mass. "Success."

BRUNNER Mfg. Co., Utica, N. Y.

CALDWELL, Robinson & Vandemark, New York, N. Y.

CHAMPION—See Cleveland Faucet Co.

CHAMPION, F. M., Utica, N. Y.

CHRISTENSEN Engineering Co., Milwaukee, Wis.

CLAYTON—See International Steam Pump Co.

CLEVELAND Faucet Co., Cleveland, O. "Champion."

COMSTOCK Mfg. Co., Evanston, Ill. "Trojan."

CURTIS Pneumatic Machinery Co., St. Louis, Mo.

CYCLONE—See Judd & Leland Mfg. Co.

DAVIS—See Hinckley Machine Works.

DEAD EASY—See Globe Mfg. Co.

EUREKA—See Bishop-Babcock-Becker Co.

EUREKA Air Compressor Co., Bloomfield, N. J.

FAIRBANKS, Morse & Co., Chicago, Ill.

FAULTLESS Engine Co., Kansas City, Mo.

FORT Wayne Engineering & Mfg. Co., Fort Wayne, Ind. "Paul."

GARDNER Governor Co., Quincy, Ill. "Gee Gee." (See page 735.)

GEE GEE—See Gardner Governor Co.

GENERAL Utility Co., Philadelphia, Pa. "Guco."

GIFFORD Engine Co., Lansing, Mich.

GLEASON-PETERS Air Pump Co., Brooklyn, N. Y.

GLOBE Mfg. Co., Battle Creek, Mich. "Dead Easy."

GOULDS Mfg. Co., Seneca Falls, N. Y.

GREEN Auto Specialties Co., Chicago, Ill.

GUCO—See General Utility Co.

HALE Electric & Engineering Co., Cleveland, Ohio.

HARTFORD Machine Screw Co., 484 Capitol Ave., Hartford, Conn. "Master." (See page 383.)

HAYWARD Tire & Equipment Co., Indianapolis, Ind.

HERZ & Co., 245 W. 55th St., New York, N. Y. "Minimax." (See page 389.)

HINCKLEY Machine Works, Hinckley, Ill. "Davis."

IMPERIAL—See Ingersoll-Rand Co.

INGERSOLL-RAND Co., 11 Broadway, New York, N. Y. "Imperial." (See page 737.)

INTERNATIONAL Steam Pump Co., New York, N. Y. "Clayton."

JACOBSON Machine Mfg. Co., Warren, Pa. (See page 851.)

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. "Cyclone," "Juleco." (See pages 415 and 799.)

JULECO—See Judd & Leland Mfg. Co.

KELLOGG Mfg. Co., Rochester, N. Y. (See page 413.)

KEWANEE Private Utilities Co., Kewanee, Ill.

LECTROFLATER—See Black & Decker Mfg. Co.

LIPMAN Air Appliance Co., Beloit, Wis.

LITTLE GIANT—See Orange Machine & Mfg. Co.

MANLEY—See United Engine & Mfg. Co.

MASTER—See Hartford Machine Screw Co.

MAYO Mfg. Co., 58 E. 18th St., Chicago, Ill. (See page 735.)

MINIMAX—See Herz & Co.

MUELLER, Wm. F., Milwaukee, Wis.

NAGLE Corliss Engine Works, Erie, Pa. (See page 735.)

NATIONAL Brake & Electric Co., Milwaukee, Wis.

NATIONAL-STANDARD Co., Niles, Mich.

NORTHERN Engineering Works, Detroit, Mich.

OHIO Compressor Co., Cincinnati, O.

ORANGE Machine & Mfg. Co., Orange, N. J. "Little Giant."

OWEN Air Compressor Works, N. E., Springfield, O.

PAUL—See Fort Wayne Engineering & Mfg. Co.

SARGENT Steam Meter Co., Chicago, Ill.

SMITH, Irvin C., Los Angeles, Cal.

SPACKE Machine Co., F. W., Indianapolis, Ind. (See page 325.)

SPICER Mfg. Co., Groton, Conn.

STAR Brass Works, Chicago, Ill. "Binks."

STROH & Dorman, Barberton, O.

SUCCESS—See Brown Beer Pump Co.

SUPERIOR Machine & Engineering Co., Detroit, Mich. "Yale."

TOPPING Bros., New York, N. Y.

TROJAN—See Comstock Mfg. Co.

UNION Steam Pump Co., Battle Creek, Mich.

UNITED Engine & Mfg. Co., Hanover, Pa. "Manley."

UNITED States Air Compressor Co., Cleveland, O.

UNITED States Electrical Tool Co., Cincinnati, O. (See page 683.)

VARWIG Mfg. Co., Cincinnati, O.

VICTOR Electric Co., Chicago, Ill.

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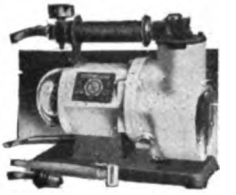
Install one of these machines in your place of business and you will be surprised at the result. Nothing attracts customers like free air, and experience has shown that customers like the Lectroflater so well they immediately inquire about a small one for their own garage. Now is your chance. Your profits on these soon pay for your own equipment and the rest is velvet.



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9. Stands up to rough usage
10. Automatically lubricates
11. Has all working parts inclosed
12. Comes completely equipped
13. Costs less than make-shift outfits
14. Operates under a broad guarantee of responsible mfrs.
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16. Sells across the counter
17. Returns a nice profit
18. Stays sold

Size No. 1, $45.00; Size No. 2, $65.00; Size No. 2 on carriage, $80.00
Write Now. The Season Is On.

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105 S. CALVERT STREET BALTIMORE, MARYLAND

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For Dealers

The "Imperial" Type XII Air Compressors are built for service—reliable service independent of attention from the garage men.

They are carefully built of selected materials, to insure dependability. They are simple in design and avoid complicated parts. They are automatically lubricated and, once the crank case is filled with oil, will operate practically independent of attention for long periods of time.

Mr. Garageman, an "Imperial" is a lasting, paying investment.

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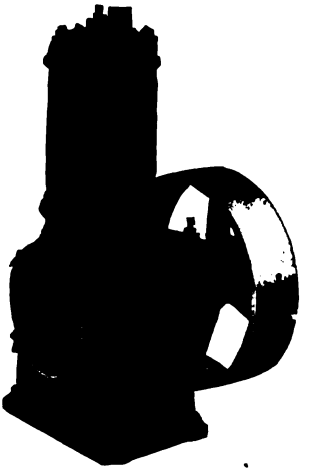

"IMPERIAL" TYPE XII

Air Cooled Water Cooled Hopper Cooled
Power Driven Electric Units

For Garage Owners

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11 Broadway New York

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PUMPS (Continued)

GARAGE PUMPS AND AIR COMPRESSORS (Continued)

WERNICKE-HATCHER Pump Co., Grand Rapids, Mich.

WESTINGHOUSE Air Brake Co., Pittsburg, Pa.

WILLIAMS Foundry & Machine Co., Akron, O. "Akron-Williams."

YALE—See Superior Machine & Engineering Co.

WHITCOMB-BLAISDELL Machine Tool Co., Worcester, Mass.

WHITING Co., Geo., Chicago, Ill.

WILLIAMS, White & Co., Moline, Ill. "Moline."

X L C R—See Excelsior Tool & Machine Co.

YODER Co., C. M., Cleveland, O. (See page 721.)

ARCH AND WASHER PUNCHES

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

JOHNSON, Wm., Newark, N. J.

KRAEUTER & Co., Newark, N. J.

PUNCHES

PUNCHES AND SHEARS

BADGER State Machine Co., Janesville, Wis.

BERTSCH & Co., Cambridge City, Ind.

BICKNELL Mfg. & Supply Co., Janesville, Wis.

BLISS Co., E. W., Brooklyn, N. Y.

BUFFALO Forge Co., Buffalo, N. Y.

CANEDY-OTTO Mfg. Co., Chicago Heights, Ill.

CHAMPION Blower & Forge Co., Lancaster, Pa.

CLARK Foundry Co., Rumford, Me.

CLEVELAND Punch & Shear Works Co., Cleveland, O.

CLOUGH, R. M., Tolland, Conn

EXCELSIOR Tool & Machine Co., East St. Louis, Ill. "X L C R."

FERRACUTE Machine Co., Bridgeton, N. J.

HUNTINGTON Machine & Foundry Co., Huntington, Ind.

KANE & Roach, Syracuse, N. Y.

LITTLE Giant Punch & Shear Co., Sparta, Ill.

LONG & Allstatter Co., Hamilton, O.

MASSILLON Foundry & Machine Co., Massillon, O.

MITTS & Merrill, Saginaw, Mich.

MOLINE—See Williams, White & Co.

NEW Doty Mfg. Co., Janesville, Wis.

NIAGARA Machine & Tool Works, Buffalo, N. Y.

NILES-BEMENT-POND Co., New York, N. Y.

PERKINS Machine Co., Warren, Mass.

QUICKWORK—See Smith, H. Collier.

ROBINSON Mfg. Co., J. M., Cincinnati, O.

ROCK River Machine Co., Janesville, Wis.

ROYERSFORD Foundry & Machine Co., Royersford, Pa.

SCHATZ Mfg. Co., Poughkeepsie, N. Y.

SMITH, H. Collier, Detroit, Mich. "Quickwork."

STOLL Co., D. H., Buffalo, N. Y.

TOLEDO Machine & Tool Co., Toledo, O.

UNION Mfg. Co., New Britain, Conn.

CENTER AND PRICK PUNCHES

BEALL Bros., Alton, Ill.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BUFFUM Tool Co., Louisiana, Mo.

CARVER Tool Works, Spring Valley, N. Y.

CINCINNATI Tool Co., Norwood O., "Hargrave."

CRONK & Carrier Mfg. Co., Elmira, N. Y.

DEUSE, J. S., Chester, Conn.

EASY HOLD—See West Haven Mfg. Co.

EVANSVILLE Tool Works, Evansville, Ind.

GOODELL-PRATT Co., Greenfield, Mass.

HARGRAVE—See Cincinnati Tool Co.

JOHNSON, Wm., Newark, N. J.

KRAEUTER & Co., Newark, N. J.

LOWENTRAUT Mfg. Co., P., Newark, N. J.

MARCY Tool Works, Putnam, Conn.

MAYHEW Co., H. H., Shelburne Falls, Mass.

O. K.—See West Haven Mfg. Co.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

S. & I. Co., Springfield, Mass.

STARRETT Co., L. S., Athol, Mass.

STORTZ & Son, John, Philadelphia, Pa.

SYRACUSE Twist Drill Co., Syracuse, N. Y.

TUCK Mfg. Co., Brockton, Mass.

WEST Haven Mfg. Co., New Haven, Conn. "O. K.," "Easy Hold."

PORTABLE HAND PUNCHES

ARMSTRONG-BLUM Mfg. Co., Chicago, Ill. "Marvel."

BUFFALO Forge Co., Buffalo, N. Y.

CLOUGH, R. M., Tolland, Conn.

EVANSVILLE Tool Works, Evansville, Ind.

EXCELSIOR Tool & Machine Co., East St. Louis, Ill. "Little Giant."

HUNTINGTON Machine & Foundry Co., Huntington, Ind.

KIDDER Mfg. Co., J. F., Burlington, Vt.

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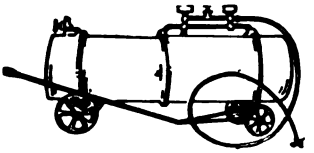

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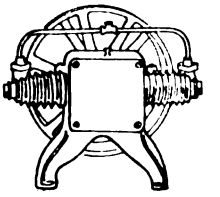

Two cylinders. Air cooled. Capacity 200 lbs. Power required, 1 h.p. Dustproof & noiseless. Floor space 18 x 20 inches. 100 lbs. pressure pumped in 12 minutes into Tank 12 x 44.

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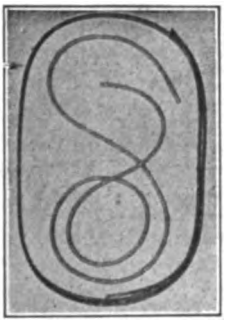

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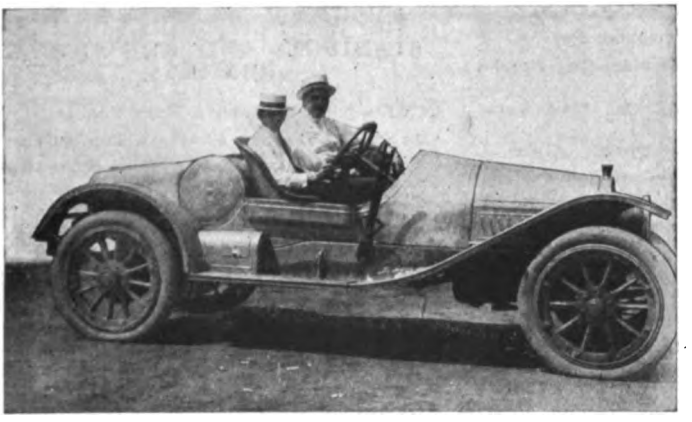

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PUNCHES (Continued)

PORTABLE HAND PUNCHES (Continued)

LITTLE GIANT—See Excelsior Tool & Machine Co.

LITTLE Giant Punch & Shear Co., Sparta, Ill.

MARVEL—See Armstrong-Blum Mfg. Co.

SCHATZ Mfg. Co., Poughkeepsie, N. Y.

PRICK PUNCHES

(See Punches, Center and Prick)

WASHER PUNCHES

(See Punches, Arch and Washer)

PYROMETERS

ADVANCE—See Wilson-Maeulen Co.

BRISTOL Co., Waterbury, Conn.

BROWN Instrument Co., Philadelphia, Pa.

DU Vivier, Ernest H., New York, N. Y. (Importer.)

ESTERLINE Co., Indianapolis, Ind.

HANOVIA Chemical & Mfg. Co., Newark, N.J.

HOSKINS Mfg. Co., Detroit, Mich.

LE CHATELIER—See Wilson-Maeulen Co.

LEEDS & Northrup Co., Philadelphia, Pa.

PYOD—See Wilson-Maeulen Co.

PYROSCOPE—See Shore Instrument & Mfg. Co.

QUEEN-GRAY Co., Philadelphia, Pa.

SCHAEFFER & Budenberg Mfg. Co., Brooklyn, N. Y.

SHORE Instrument & Mfg. Co., New York, N. Y. "Pyroscope."

STUPAKOFF Laboratories, Pittsburg, Pa.

TAPALOG—See Wilson-Maeulen Co.

TAYLOR Instrument Cos., Rochester, N. Y. "Tyces."

THWING Instrument Co., Philadelphia, Pa. "Twinko."

TWINKO—See Thwing Instrument Co.

TYCOS—See Taylor Instrument Cos.

UNIPIVOT—See Wilson-Maeulen Co.

WILSON-MAEULEN Co., New York, N. Y. "Advance," "Le Chatelier," "Unipivot," "Pyod," "Tapalog."

ZAUBITZ, August, New York, N. Y.

RACKS

DRILL RACKS

DRIVER Co., C. H., Racine, Wis.

METAL TOOL STOCK AND TIRE RACKS

ALLSTEELEQUIP Co., Aurora, Ill.

BERGER Mfg. Co., Canton, O.

CLARK Co., W. J., Salem, O.

CLEVELAND Cyclone Fence Co., Cleveland, O.

CLEVELAND Wire Spring Co., Cleveland, O.

DARBY & Sons Co., Edward, Philadelphia, Pa.

DURAND-STEEL Locker Co., Chicago, Ill.

ELGIN Motor Power Mfg. Co., Cedar Rapids, Ia. (See page 717.)

FEDERAL Steel Fixture Co., Chicago, Ill.

HETTS Co., Detroit, Mich.

JEFFERIS Co., R. W., Camden, N. J.

LYON Metallic Mfg. Co., Aurora, Ill. (See page 715.)

MANUFACTURING, Equipment & Engineering Co., Boston, Mass.

MOTOR Tire & Accessories Co., 809 N. Broad St., Philadelphia, Pa. (See page 745.)

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 753.)

OHIO Mfg. Co., Painesville, O.

SHULTS & Co., H. H., Gowanda, N. Y.

TERRELL'S Equipment Co., Grand Rapids, Mich.

VAN Dorn Iron Works, Cleveland, O.

WALLACE Supplies Mfg. Co., Chicago, Ill.

WESTERN Tool & Mfg. Co., Springfield, O.

REAMERS

STANDARD AND ADJUSTABLE REAMERS

ACME—See Schellenbach-Hunt Tool Co.

ADAMANTINE—See American Tap & Die Co.

AMERICAN Tap & Die Co., Greenfield, Mass. "Adamantine." (See page 757.)

BILLINGS & Spencer Co., Hartford, Conn.

BRUBAKER & Bros., W. L., Millersburg, Pa.

CELFOR Tool Co., Buchanan, Mich.

CHADWICK & Trefethan, Portsmouth, N. H. "Critchley."

CLEVELAND Twist Drill Co., Cleveland, O. "Paradox," "Peerless."

CLOUGH, R. M., Tolland, Conn.

CRITCHLEY—See Chadwick & Trefethan.

DETROIT Twist Drill Co., Detroit, Mich. (See page 687.)

DIAMOND—See Whitman & Barnes Mfg. Co.

GISHOLT Machine Co., Madison, Wis.

GRANT Nail & Supply Co., Boston, Mass. "Turney."

GREENFIELD Tap & Die Corp., Greenfield, Mass. (See page 755.)

HERCULES—See Wells & Son Co.

IDEAL—See McCrosky Reamer Co.

KELLY Reamer Co., Cleveland, O.

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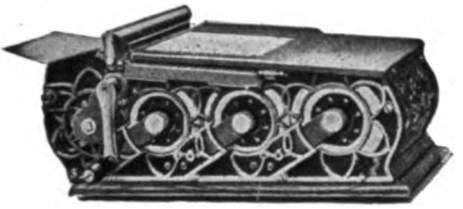

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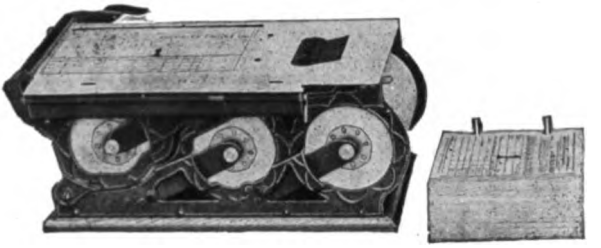

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MORSE Twist Drill & Machine Co., New Bedford, Mass.

NATIONAL Twist Drill & Tool Co., Detroit, Mich.

OHIO Reamer Co., Cleveland, O.

ONE Lock Reamer Co., New Haven, Conn.

PARADOX—See Cleveland Twist Drill Co.

PEERLESS—See Cleveland Twist Drill Co.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

RICH Tool Co., Chicago, Ill.

ROGERS Works, John M., Gloucester City, N. J.

SCHELLENBACH-HUNT Tool Co., Cincinnati, O. "Acme."

SCREW Machine Products Corp., Providence, R. I.

STANDARD Tool Co., Cleveland, O.

STAPF & Co., John B., Dunkirk, N. Y.

TURNEY—See Grant Nail & Supply Co.

WELLS & Son Co., F. E., Greenfield, Mass. "Hercules."

WHITMAN & Barnes Mfg. Co., Akron, O. "Diamond."

VALVE STEM GUIDE REAMERS

HEALY Tool & Appliance Co., Buffalo, N. Y.

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AUTOGRAPHIC Register Co., Hoboken, N. J. "Shouperior."

AUTOMATIC Bookkeeping Register Co., Kansas City, Mo.

BOOKKEEPER'S Register Co., Chicago, Ill.

EGRY Register Co., Dayton, O. (See page 741.)

HAMILTON Autographic Register Co., Hamilton, O. (See page 741.)

K. & B. Register Co., Hamilton, O. (See page 741.)

McCASKEY Register Co., Alliance, O. (See page 743.)

SHOUPERIOR—See Autographic Register Co.

STANDARD Register Co., Dayton, O.

UNITED Autographic Register Co., 556-58 W. Jackson Blvd., Chicago, Ill. (See page 741.)

REMAGNETIZERS

MAGNET REMAGNETIZERS

ELECTRIC Equipment Co., Los Angeles, Cal.

ESTERLINE Co., Indianapolis, Ind.

McDONALD & Son Electric Co., C. C., Chenoa, Ill.

METZGER-DANIELS Co., Chicago, Ill.

MORGAN, C. W., Chicago, Ill.

QUALITY—See Sypher Tool Mfg. Co.

ST. LOUIS Electrical Works, St. Louis, Mo.

SYPHER Tool Mfg. Co., Toledo, O. "Quality."

TECO—See Tritt Electric Co.

TOWNSEN-REMINGTON Electric Co., Fort Worth, Tex. "Treco."

TRECO—See Townsen-Remington Electric Co.

TRITT Electric Co., Union City, Ind. "Teco."

WILLIAMS, E. Q., Syracuse, N. Y.

RIDDLES

FOUNDRY RIDDLES AND SIEVES

BUFFALO Wire Works Co., Buffalo, N. Y.

DARBY & Sons Co., Edward, Philadelphia, Pa.

DEAN Wire Goods Co., Worcester, Mass.

TAYLOR & Dean, Pittsburg, Pa.

TYLER Co., W. S., Cleveland, O.

WRIGHT Wire Co., Worcester, Mass. (See page 437.)

ROLLS

BENDING AND STRAIGHTENING ROLLS

BADGER State Machine Co., Janesville, Wis.

BERTSCH & Co., Cambridge City, Ind.

HUNTINGTON Machine & Foundry Co., Huntington, Ind.

KANE & Roach, Syracuse, N. Y.

NEW Doty Mfg. Co., Janesville, Wis.

NIAGARA Machine & Tool Works, Buffalo, N. Y.

NILES-BEMENT-POND Co., New York, N. Y.

PERKINS Machine Co., Warren, Mass.

PETTINGELL Machine Co., Amesbury, Mass.

ROCK River Machine Co., Janesville, Wis.

TOLEDO Machine & Tool Co., Toledo, O.

WHITCOMB-BLAISDELL Machine Tool Co., Worcester, Mass.

WHITING Co., Geo., Chicago, Ill.

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PAINT AND VARNISH DRYING ROOMS

CUTLER Dry Kiln Co., Buffalo, N. Y.

PERKINS, Elmer E., Chicago, Ill.

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BROWN & Sharpe Mfg. Co., Providence, R. I.
GOODELL-PRATT Co., Greenfield, Mass.
KEUFFEL & Esser Co., Hoboken, N. J.
LUFKIN Rule Co., Saginaw, Mich.
STARRETT Co., L. S., Athol, Mass.
UNION Caliper Co., Orange, Mass.
WYKE, J., Wilmington, Mass.

SANDERS

WOOD SANDERS

AMERICAN Wood Working Machinery Co., Rochester, N. Y.
BENTEL & Margedant Co., Hamilton, O.
CORDESMAN, Meyer & Co., Cincinnati, O.
CORDESMAN-RECHTIN Co., Cincinnati, O.
CURTIS Machine Corp., Jamestown, N. Y.
DEFIANCE Machine Works, Defiance, O.
FAY & Egan Co., J. A., Cincinnati, O.
HALL & Brown Woodworking Machine Co., St. Louis, Mo.
JONES Superior Machine Co., Chicago, Ill.
OBER Mfg. Co., Chagrin Falls, O.
OLIVER Machinery Co., Grand Rapids, Mich.
PEERLESS Surface Machine Co., Newark, N. J.
PRYIBIL Machine Co., P., New York, N. Y.
ROOT Co., B. M., York, Pa.
SMITH Machine Co., H. B., Smithville, N. J.
WYSONG & Miles Co., Greensboro, N. C.

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BAND SAWING MACHINES

AMERICAN Saw Mill Machinery Co., Hackettstown, N. J.
AMERICAN Wood Working Machinery Co., Rochester, N. Y.
BENTEL & Margedant Co., Hamilton, O.
CORDESMAN, Meyer & Co., Cincinnati O.
CORDESMAN-RECHTIN Co., Cincinnati, O.
CRESCENT Machine Co., Leetonia, O.
DEFIANCE Machine Works, Defiance, O.
FAY & Egan Co., J. A., Cincinnati, O.
GOODSPEED Machine Co., Winchenden, Mass.
HALL & Brown Woodworking Machine Co., St. Louis, Mo.
HILES & Co., C. A., Chicago, Ill.
JONES Superior Machine Co., Chicago, Ill.
KANE & Roach, Syracuse, N. Y.
MARSTON & Co., J. M., Boston, Mass.
OLIVER Machinery Co., Grand Rapids, Mich.
POWER & Co., L., Philadelphia, Pa.
PRYIBIL Machine Co., P., New York, N. Y.
ROOT Co., B. M., York, Pa.
SILVER Mfg. Co., Salem, O.
SMITH Machine Co., H. B., Smithville, N. J.
WEST Side Iron Works, Grand Rapids, Mich.

CIRCULAR SAW TABLES

AMERICAN Saw Mill Machinery Co., Hackettstown, N. J.
AMERICAN Wood Working Machinery Co., Rochester, N. Y.
BAKER Bros., Toledo, O.
BEACH Mfg. Co., Montrose, Pa.
BENTEL & Margedant Co., Hamilton, O.
CORDESMAN, Meyer & Co., Cincinnati, O.
CRESCENT Machine Co., Leetonia, O.
FAY & Egan Co., J. A., Cincinnati, O.
GREENLEE Bros. & Co., Rockford, Ill.
MARSTON & Co., J. M., Boston, Mass.
OLIVER Machinery Co., Grand Rapids, Mich.
POWER & Co., L., Philadelphia, Pa.
PRYIBIL Machine Co., P., New York, N. Y.
SMITH Machine Co., H. B., Smithville, N. J.

COLD SAW CUTTING-OFF MACHINES

BILLINGS & Spencer Co., Hartford, Conn.
BURKE Machine Tool Co., Conneaut, O.
BURR & Sons, John T., Brooklyn, N. Y.
COCHRANE-BLY Co., Rochester, N. Y.
ESPEN-LUCAS Machine Works, Philadelphia, Pa.
HIGLEY Machine Co., New York, N. Y.
MOTOR Parts Co., Plainfield, N. J.
NUTTER & Barnes Co., Hinsdale, N. H.
TINDEL-MORRIS Co., Eddystone, Pa.

HAND SAWS

(Rip and Cross Cut)

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BISHOP & Co., Geo. H. Lawrenceburg, Ind. "Greyhound."
CENTRAL Hardware Co., Philadelphia, Pa.
DISSTON & Sons, Henry, Philadelphia, Pa.
GREYHOUND—See Bishop & Co.
JENNINGS & Co., C. E., New York, N. Y.
OHLEN & Sons Saw Mfg. Co., James, Columbus, O.
PENNSYLVANIA Saw Co., Frackville, Pa.
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YORK Saw Works, York, Pa.

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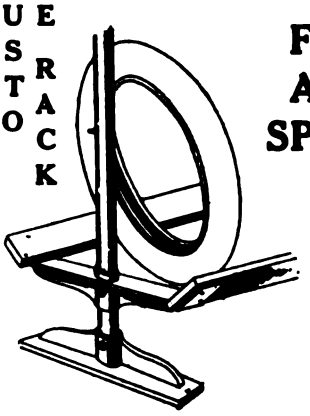

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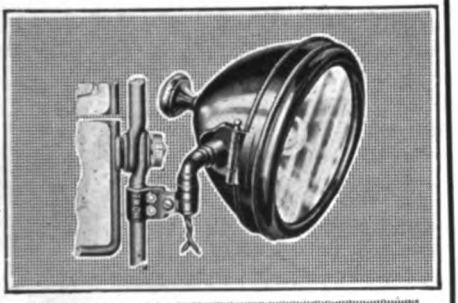

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ARMSTRONG-BLUM Mfg. Co., Chicago, Ill. "Marvel."

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DIAMOND Saw & Stamping Works, Buffalo, N. Y. "Sterling."

ECONOMY—See Robertson Machine & Foundry Co.

FRONTIER Iron Works, Buffalo, N. Y. "Royal."

GOODELL-PRATT Co., Greenfield, Mass.

HOEFER Mfg. Co., Freeport, Ill.

KWIK-KUT—See Atkins & Co.

MARVEL—See Armstrong-Blum Mfg. Co.

MASSACHUSETTS Saw Works, Springfield, Mass.

MILFORD—See Thompson & Son Co.

MILLERS Falls Co., Millers Falls, Mass.

MILLERS Falls Co., New York, N. Y.

MYERS Machine Tool Co., Columbia, Pa.

NORTH Wales Machine Co., North Wales, Pa.

OLMSTED'S Son, L. H., Hasbrouck Heights, N. J.

RACINE Tool & Machine Co., Racine, Wis.

ROBERTSON Machine & Foundry Co., Buffalo, N. Y. "Economy."

ROYAL—See Frontier Iron Works.

STAR—See Miller's Falls Co.

STERLING—See Diamond Saw & Stamping Works.

THOMPSON & Son Co., Henry G., New Haven, Conn. "Milford."

UNIVERSAL—See West Haven Mfg. Co.

VULCAN Engineering Sales Co., Chicago, Ill.

WESTERN Tool & Mfg. Co., Springfield, O.

WEST Haven Mfg. Co., New Haven, Conn. "Universal," "Acme."

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CONNELL & Dengler Machine Co., Rochester, N. Y.

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CORDESMAN-RECHTIN Co., Cincinnati, O.

CRESCENT Machine Co., Leetonia, O.

CURTIS Pneumatic Machinery Co., St. Louis, Mo.

DEFIANCE Machine Works, Defiance, O.

FAY & Egan Co., J. A., Cincinnati, O.

GREENLEE Bros. & Co., Rockford, Ill.

HALL & Brown Woodworking Machine Co., St. Louis, Mo.

JONES Superior Machine Co., Chicago, Ill.

KANE & Roach, Syracuse, N. Y.

OLIVER Machinery Co., Grand Rapids, Mich.

PORTER Machinery Co., C. O., Grand Rapids, Mich.

SILVER Mfg. Co., Salem, O.

SMITH Machine Co., H. B., Smithville, N. J.

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HILES & Co., C. A., Chicago, Ill.

LEWIS Foundry & Machine Co., Pittsburg, Pa.

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DISSTON & Sons, Henry, Philadelphia, Pa. "Premier."

HUNTER Saw & Machine Co., Pittsburg, Pa.

OHLEN & Sons Saw Mfg. Co., James, Columbus, O.

PREMIER—See Disston & Sons.

SIMONDS Mfg. Co., Fitchburg, Mass.

TABOR Mfg. Co., Philadelphia, Pa. "Taylor-Newbold."

TAYLOR-NEWBOLD—See Tabor Mfg. Co.

TINDEL-MORRIS Co., Eddystone, Pa.

YORK Saw Works, York, Pa.

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BUFFUM Tool Co., Louisiana, Mo.

HAYES File Co., Detroit, Mich.

KRAEUTER & Co., Newark, N. J.

LUTZ—See Western Tool & Mfg. Co.

MOUND Tool Co., Seventh & Hickory Sts., St. Louis, Mo. (See page 747.)

OSBORNE & Co., C. S., Harrison, N. J.

STORTZ & Son, John, Philadelphia, Pa.

VLCHEK Tool Co., Cleveland, O.

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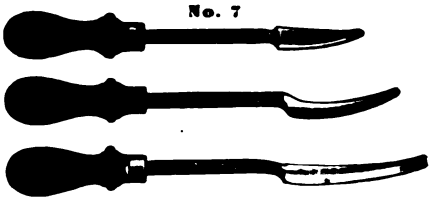

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ROPER—See American Tool & Machine Co.

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DREW & Co., C., Kingston, N. Y.

JOHNSON, Wm., Newark, N. J.

KRAEUTER & Co., Newark, N. J.

LOWENTRAUT Mfg. Co., P., Newark, N. J.

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PEXTO—See Peck, Stow & Wilcox Co.

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GOULD & Eberhardt, Newark, N. J.

HENDEY Machine Co., Torrington, Conn.

JUENGST & Sons, Geo., Croton Falls, N. Y.

KELLY Co., R. A., Xenia, O.

NILES-BEMENT-POND Co., New York, N. Y.

OHIO Machine Tool Co., Kenton, O.

POTTER & Johnston Machine Co., Pawtucket, R. I.

QUEEN City Machine Tool Co., Cincinnati, O.

ROCKFORD Machine Tool Co., Rockford, Ill.

SMITH & Mills Co., Cincinnati, O.

SPRINGFIELD Machine Tool Co., Springfield, O.

STAPF & Co., John B., Dunkirk, N. Y.

STEPTOE Co., John, Cincinnati, O.

STOCKBRIDGE Machine Co., Worcester, Mass.

WALCOTT & Wood Machine Tool Co., Jackson, Mich.

WOOD SHAPERS

ADVANCE Machinery Co., Toledo, O. (See page 609.)

AMERICAN Wood Working Machinery Co., Rochester, N. Y.

BARKER & Co., Wm., Covington, Ky.

BENTEL & Margedant Co., Hamilton, O.

CORDESMAN, Meyer & Co., Cincinnati, O.

CORDESMAN-RECHTIN Co., Cincinnati, O.

CRESCENT Machine Co., Leetonia, O.

DEFIANCE Machine Works, Defiance, O.

FAY & Egan Co., J. A., Cincinnati, O.

HALL & Brown Woodworking Machine Co., St. Louis, Mo.

JONES Superior Machine Co., Chicago, Ill.

PORTER Machinery Co., C. O., Grand Rapids, Mich.

POWER & Co., L., Philadelphia, Pa.

PRYIBIL Machine Co., P., New York, N. Y.

SMITH Machine Co., H. B., Smithville, N. J

WHITNEY & Son, Baxter D., Winchendon, Mass.

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FILE SHARPENERS

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SPOKE SHAVES

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GOODELL-PRATT Co., Greenfield, Mass.

HARGRAVE—See Cincinnati Tool Co.

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SCIENTIFICALLY DESIGNED
ACCURATELY HEAT TREATED

WILLIAM and HARVEY ROWLAND, Inc.,

FRANKFORD, PHILADELPHIA, PA.

Branch Office: Dime Bank Building, Detroit, Mich.

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SHEARS

LEVER SHEARS

BADGER State Machine Co., Janesville, Wis.

BERTSCH & Co., Cambridge City, Ind.

CHICAGO Patented Tools Co., Racine, Wis. "Potslada."

EDWARDS, C. D., Albert Lea, Minn.

FARREL Foundry & Machine Co., Ansonia, Conn.

GROOS, C., Racine, Wis.

NIAGARA Machine & Tool Works, Buffalo, N. Y.

POTSLADA—See Chicago Patented Tools Co.

ROBINSON Mfg. Co., J. M., Cincinnati, O.

SCHATZ Mfg. Co., Poughkeepsie, N. Y.

WATERBURY Farrel Foundry & Machine Co., Waterbury, Conn.

SHOVELS

MOLDERS SHOVELS

AMES & Sons Corp., Oliver, North Easton Mass.

BEALL Bros., Alton, Ill.

HUBBARD & Co., Pittsburg, Pa.

PFEIFER & Co., John, Philadelphia, Pa.

PITTSBURG Shovel Co., Pittsburg, Pa.

WOOD Shovel & Tool Co., Piqua, O.

WYOMING Shovel Works, Wyoming, Pa.

SLOTTERS

SCREW SLOTTERS

ACME—See National-Acme Mfg. Co.

DAVIS Sewing Machine Co., Dayton, O.

GARVIN Machine Co., New York, N. Y.

MANVILLE Machine Co., E. J., Waterbury, Conn.

NATIONAL-ACME Mfg. Co., Cleveland, O. "Acme."
(See page 441.)

SNIPS

METAL SNIPS OR SHEARS

ACME Shear Co., Bridgeport, Conn. **"Ajax," "Star."**

AJAX—See Acme Shear Co.

BARTLETT Mfg. Co., Detroit, Mich.

BERGMAN Tool Mfg. Co., Buffalo, N. Y.

BRIDGEPORT Hardware Mfg. Corp., Bridgeport, Conn. "Titan," "Bull Dog," "So-Handy."

BULL DOG—See Bridgeport Hardware Mfg. Corp.

CLAUSS Shear Co., Fremont, O.

DUDLY Tool Co., Menominee, Mich.

HEINISCH'S Sons Co., R., Newark, N. J.

KRAEUTER & Co., Newark, N. J.

NATIONAL Cutlery Co., Philadelphia, Pa.

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

SO-HANDY—See Bridgeport Hardware Mfg. Corp.

STAR—See Acme Shear Co.

STORTZ & Son, John, Philadelphia, Pa.

TITAN—See Bridgeport Hardware Mfg. Corp.

VIKING Shear Co., Erie, Pa.

SOLDER

ALUMINUM SOLDER

ACME—See Universal Fluxine Co.

ALUMALUX Co., Sidney, O.

ARROW—See Lester Co.

CHEMICAL Specialties Co., Kansas City, Mo. "Perfection."

CITY Brass Foundry Co., Cleveland, O.

DELAWARE Brass & Aluminum Co., Muncie, Ind.
(See page 147.)

DICKS, E. M., Marion, O.

ELECTRIC Smelting & Aluminum Co., Lockport, N. Y.

HOWARD Metal Co., Reading, Pa.

ILLINOIS Smelting & Refining Co., Chicago, Ill.

IMPERIAL Aluminum Solder Co., New York, N. Y.

JANNEY, Steinmetz & Co., Philadelphia, Pa. "Richards."
(See page 515.)

LANGSENKAMP, F. H., Indianapolis, Ind.

LESTER Co., Fayetteville, N. Y. **"Arrow."**

LUMEN Bearing Co., Buffalo, N. Y.
(See page opposite Last Page.)

MORE-JONES Brass & Metal Co., St. Louis, Mo.

NATIONAL Bronze & Aluminum Foundry Co., Cleveland, O.

NAULTY, James, Philadelphia, Pa.

PERFECTION—See Chemical Specialties Co.

REEPS Mfg. Co., New York, N. Y.

RELS Mfg. Co., Brooklyn, N. Y.

RICHARDS—See Janney, Steinmetz & Co.

RICHARDS & Co., Boston, Mass.

SEMPER IDEM—See Wildes Son.

SO-LUMINUM Mfg. & Engineering Co., New York, N. Y.

THWING, C. B., Philadelphia, Pa.

UNITED Smelting & Aluminum Co., New Haven, Conn. "W. F."

UNIVERSAL Fluxine Co., Urbana, O. "Acme."

W. F.—See United Smelting & Aluminum Co.

WILDES Son, Thomas, New York, N. Y. "Semper Idem."

WILKES-BARRE Welding Co., Wilkes-Barre, Pa. **"Wizard."**

WIZARD—See Wilkes-Barre Welding Co.

Complete Index to Classification appears on Pages 8 to 27.

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SILVER SOLDER

Silver Solder for all kinds of fine, light and heavy brazing. Advise us your needs and we will send sample and quote price on grade best suited to your requirements.

MANIFOLDS

We are also manufacturers of Brass, Copper and Steel Tube Manifolds. Send blue-prints and specifications for quotations.

ALL KINDS OF BRASS AND COPPER BRAZING

MILLER METALWORK COMPANY 411 St. Paul's Ave., Jersey City, N. J.

Guaranteed Popular Price Auto Clocks that will pay you a good profit and give excellent satisfaction.

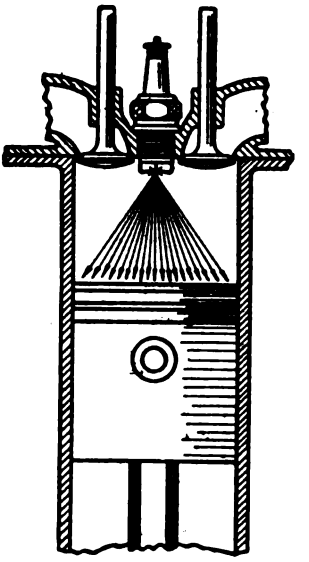
Made in one and eight day for cowl dash, also models for Ford cars. Let us send you discount and circulars; they will interest you.

Manufactured by

THE SESSIONS CLOCK CO.
Forestville, Conn.
37 Maiden Lane, New York, N. Y.

Valve in the Head Motors
Deliver the Power Directly

On the Top of the Piston!
Like This



Sterling Motors Have
The Valves in the Head

Sterling Motor Company
Detroit, Mich.

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SOLDER (Continued)

BAR AND WIRE SOLDER

BIRKENSTEIN & Sons, S., 397 W. Ontario St., Chicago, Ill. (See page 791.)

BLATCHFORD Co., E. W., Chicago, Ill.

CHICAGO Solder Co., Chicago, Ill. "Kester."

COLUMBIA Smelting & Refining Works, Brooklyn, N. Y.

DUTCH BOY—See National Lead Co.

EMPIRE Metal Co., Syracuse, N. Y.

GARDINER Metal Co., Chicago, Ill.

HENNING & Sons, V., Brooklyn, N. Y.

HOYT Metal Co., 300 N. Broadway, St. Louis, Mo. (See page 145.)

KESTER—See Chicago Solder Co.

KAHN Bros., Brooklyn, N. Y.

LEHMAN Bros., Hoboken, N. J.

LISSBERGER & Son, Marks, Long Island City, N. Y.

LUMEN Bearing Co., Buffalo, N. Y. (See page opposite Last Page.)

MERCHANT & Evans Co., Philadelphia, Pa. (See page 405.)

MORE-JONES Brass & Metal Co., St. Louis, Mo.

NATIONAL Lead Co., New York, N. Y. "Dutch Boy." (See page 153.)

NORTH American Smelting Co., Philadelphia Pa.

RICHARDS & Co., Boston, Mass.

TAYLOR Co., N. & G., Philadelphia, Pa.

WILDES Son, Thomas, New York, N. Y.

SILVER SOLDER

(See Brass, Brazing)

SQUARES

MACHINISTS SQUARES

ATHOL Machine Co., Athol, Mass.

BROWN & Sharpe Mfg. Co., Providence, R. I.

GOODELL-PRATT Co., Greenfield, Mass.

STARRETT Co., L. S., Athol, Mass.

UNION Caliper Co., Orange, Mass.

STAMPS

STEEL STAMPS

(For Numbering or Lettering Parts)

BECKER Engraving Co., August, Boston, Mass.

CHANDLER Co., Springfield, Mass.

EVERETT & Son, A., Auburn, N. Y.

HANSON Co., C. H., Chicago, Ill.

HOGGSON & Pettis Mfg. Co., New Haven, Conn.

KAUTZ & Co., Fred C., Chicago, Ill.

KNIGHT & Son, H. W., Seneca Falls, N. Y.

MATTHEWS & Co., Jas. H., Pittsburg, Pa.

MAYER Co., Geo. J., Indianapolis, Ind.

MURDOCK, Jr., Co., Jas., Cincinnati, O.

NESS, Jr., Geo. M., New York, N. Y.

NEW York Stencil Works, New York, N. Y.

NOBLE & Westbrook Mfg. Co., Hartford, Conn.

ROBBINS Mfg. Co., John, Boston, Mass.

SCHWERDTLE Stamp Co., Bridgeport, Conn.

WRIGHT & Son, Greg. G., Cincinnati, O.

TIME STAMPS

AUTOMATIC Time Stamp Co., 160 Congress St., Boston, Mass. (See page 753.)

BAIRD Equipment Co., 325 W. Ohio St., Chicago, Ill. (See page 861.)

CALCULAGRAPH Co., New York, N. Y.

COSMO—See Joslin Mfg. Co.

FOLLETT Time Recording Co., New York, N. Y.

HOGGSON & Co., S. H., New York, N. Y.

JOSLIN Mfg. Co., A. D., 233 W. Erie St., Chicago, Ill. "Cosmo." (See page 753.)

STANDS

MOTOR REPAIR STANDS

DOLDER Mfg. Co., Earlville, Ill.

HACO—See Hathorn Auto Co.

HATHORN Auto Co., Mason City, Ia. "Haco."

MANLEY—See United Engine & Mfg. Co.

ST. ALBANS Foundry & Implement Co., St. Albans, Vt.

SHEWALTER Mfg. Co., Springfield, O. "Universal."

UNITED Engine & Mfg. Co., Hanover, Pa. "Manley."

UNIVERSAL—See Shewalter Mfg. Co.

WILBER, Charles, Minneapolis, Minn.

PORTABLE TOOL STANDS

LUCAS & Son, J. L., Bridgeport, Conn.

MANLEY—See United Engine & Mfg. Co.

NEW BRITAIN Machine Co., 10 Bigelow St., New Britain, Conn. (See page 753.)

UNITED Engine & Mfg. Co., Hanover, Pa. "Manley."

WESTERN Tool & Mfg. Co., Springfield, O.

Complete Index to Classification appears on Pages 8 to 27.

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"NEW BRITAIN" PRESSED STEEL BENCH LEGS

Enable you to construct an ideal bench quicker, stronger and at less cost than by any other means. No wall support is necessary and bench can be taken up and moved easily and quickly if occasion demands, without the least injury. Equally as strong as cast iron, their much lighter weight very greatly reduces the freight bill.

You should have our catalog of Shop Furniture, embracing *Portable Work Stands—Bar Stock Racks—Frictionless Bench Drawers—Portable Vise Stands—Permanent Ladders—Drop Head Polishing Machines—Scraping Tables—Adjustable Stools—Lathe Pans—Tote Boxes, and many other indestructible conveniences.* Also metal stampings to order.

NEW BRITAIN MACHINE COMPANY

10 Bigelow Street **NEW BRITAIN, CONN.**

Durable
Accurate
Reliable
—
Price
Reasonable

Be "Time Wise" and positively know the cost of every Automobile repair job and check your workmen's time

By the use of the **Automatic Time Stamp**, a thoroughly practical and comparatively inexpensive mechanical Time Cost Keeping System may be installed which will give a correct, indisputable and automatic printed record of the exact time consumed or occupied in doing any job or piece of work.

A great many service stations use one or more of these machines and no automobile man can afford to carry on business without at least one **Automatic Time Stamp.**

We guarantee that its use will save time, money and annoyance, eliminate losses and increase profits.

Descriptive Printed Matter and Sample Time Cost tickets free on application.

THE AUTOMATIC TIME STAMP CO.

Automobile Dept., 160 Congress Street, Boston, Mass. Established 1880

Originators of the Art of Printing Time Automatically.

Also, Makers of the Automatic Time Register, the Duragraph (Elapsed Time Recorder), and Time Recording and Computing Machines for all divisions of time and for all purposes.

GARFORD
Hand Warning Signal

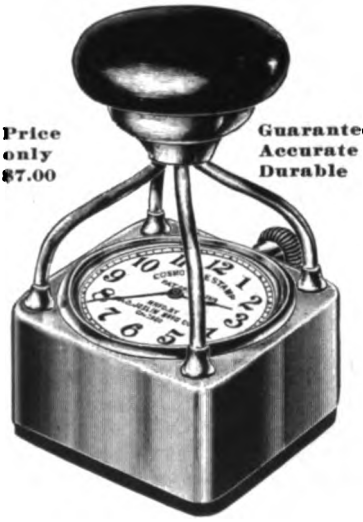
PRICE
$3.85

THE GARFORD MFG. CO.
ELYRIA, OHIO

COSMO TIME STAMP

Price
only
$7.00

Guaranteed
Accurate
Durable



Not an experiment. Thousands in use.
DON'T GUESS—KNOW whether you are making money in your repair department.
The Cosmo Time Stamp gives you the exact time on every repair job.
Write for one on 10 days' trial. No obligation to purchase.

A. D. JOSLIN MFG. CO.
233 W. Erie St., Chicago, Ill.

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STOCKS

DIE STOCKS

ACME—See American Tap & Die Co.

ADAMANTINE—See American Tap & Die Co.

AMERICAN Tap & Die Co., Greenfield, Mass. "Acme," "Adamantine." (See page 757.)

ARMSTRONG Mfg. Co., Bridgeport, Conn.

BAY State Tap & Die Co., Mansfield, Mass.

BESLY & Co., Charles H., Chicago, Ill.

BRUBAKER & Bros., W. L., Millersburg, Pa.

BUTTERFIELD & Co., Derby Line, Vt.

CARD Mfg. Co., S. W., Mansfield, Mass.

CARPENTER Tap & Die Co., J. M., Pawtucket, R. I.

CONANT & Donelson Co., Conway, Mass. "Reliable."

DUPLEX—See Hart Mfg. Co.

ECONOMY—See Wells & Son Co.

GREEN RIVER—See Greenfield Tap & Die Corp.

GREENFIELD Tap & Die Corp., Greenfield, Mass. "Little Giant," "Lightning," "Green River." (See page 755.)

HART Mfg. Co., Cleveland, O. "Duplex."

LIGHTNING—See Greenfield Tap & Die Co.

LITTLE GIANT—See Greenfield Tap & Die Corp.

LOWELL Wrench Co., Worcester, Mass.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

RELIABLE—See Conant & Donelson.

THISTLE—See Winter Bros. Co.

WELLS & Son Co., F. E., Greenfield, Mass. "Economy."

WINTER Bros. Co., Wrentham, Mass. "Thistle."

STONES

RUBBING STONES

AMERICAN Stone Co., Floyds Knobs, Ind. "Perrettes."

BENDER BIMSSTEIN—See Thurston Co.

GAMBURGER-BIMSSTEIN—See Rodriguez, R. E.

PERRETTES—See American Stone Co.

RHODES & Co., J. H., Chicago, Ill. (Importers.)

RODRIGUEZ, R. E., New York, N. Y. (Importer.) "Gamburger Bimsstein."

SCHUMACHERSCHE—See Waddell & Co.

THURSTON Co., F. W., Chicago, Ill. (Importer.) "Bender Bimsstein."

WADDELL & Co., R. J., New York, N. Y. (Importers.) "Schumachersche."

WADSWORTH, Howland & Co., Boston, Mass.

STOOLS

STEEL STOOLS

CLARK Co., W. J., Salem, O.

CLEVELAND Wire Spring Co., Cleveland, O.

ERIE Stamping & Mfg. Co., Erie, Pa.

KALAMAZOO Steel Goods Co., Kalamazoo, Mich.

MANUFACTURING, Equipment & Engineering Co., Boston, Mass.

NEW Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 753.)

OHIO Mfg. Co., Painesville, O.

SUPPLIES

ELECTRO-PLATING SUPPLIES

(This is a list of Dealers in Electro-Plating Supplies who advertise in this publication)

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

FOUNDRY SUPPLIES

BRASS Founders Supply Co., Newark, N. J.

COLEMAN Foundry Equipment Co., Cleveland, O.

HILL & Griffith Co., Cincinnati, O.

NIAGARA Devices, Buffalo, N. Y.

OBERMAYER Co., S., Cincinnati, O.

OSBORN Mfg. Co., Cleveland, O.

PAXSON Co., J. W., 1019 N. Delaware Ave., Philadelphia, Pa. (See page 725.)

STEVENS, Frederic B., Detroit, Mich. (See pages 759 and 760.)

WOODISON Co., E. J., Detroit, Mich.

MACHINE SHOP, GARAGE AND FACTORY SUPPLIES

(This is a list of Dealers in Machine Shop, Garage and Factory Supplies, who advertise in this publication)

FRASSE & Co., Peter A., New York, N. Y. (See page 491.)

MONTGOMERY & Co., 105-07 Fulton St., New York, N. Y. (See page 705.)

SWAGES

TOP AND BOTTOM SWAGES

(See Fullers and Swages)

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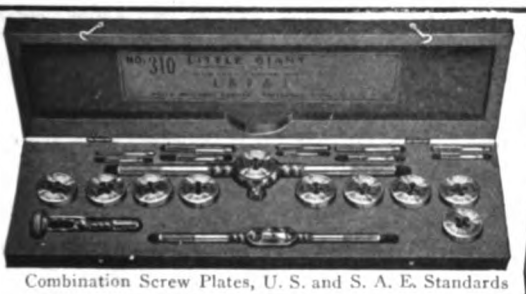


Combination Screw Plates, U. S. and S. A. E. Standards

Automobile Screw Plate.

Taper, Plug and Bottoming Hand Taps

Burring Reamer.

A Great Line of Screw Cutting Tools and Machines, Gages and Reamers

Practically every conceivable necessity of the manufacturer or repairer for tools for cutting and measuring screw threads is found in this extensive line.

Either of the trade names—"Little Giant," "Lightning," "Green River" or "Smart"—represents the highest quality and most efficient service possible to attain.

For 40 years these tools and machines have made good. The line includes—

Taps	**Reamers**
Dies	**Gages**
Screw Plates	**Threading Machines, etc.**

Our newest catalog gives the complete line. Send for it today.

Greenfield Tap and Die Corporation

Wells Brothers Company Division, Wiley & Russell Mfg. Co. Division, A. J. Smart Mfg. Co. Division.

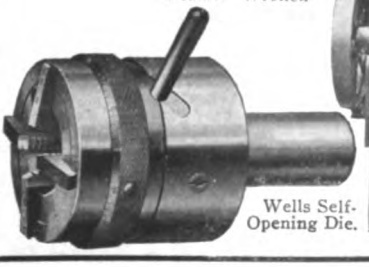
Greenfield, Mass.

New York, 28 Warren St.
Chicago, 13 So. Clinton St.
Philadelphia, 38 No. Sixth St.
Detroit, 55, 57, 59 Wayne St.
London, 149 Queen Victoria St.
Canada, Wells Brothers Company of Canada, Ltd., Galt, Ont.

Acorn Die and Holder

Taper Pin Reamer

Tap Wrench



Wells Self-Opening Die.

Threading Machine Little Giant

Little Giant Thread Limit Gages.

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SYSTEMS

SAND BLAST SYSTEMS

PANGBORN Corp., Hagerstown, Md.

TILGHMAN-BROOKSAND Sand Blast Co., Philadelphia, Pa.

TANKS

CHEMICAL FIRE TANKS

ACCURATE—See National Metal Stamping & Mfg. Co.

CHAMPION—See National Metal Stamping & Mfg. Co.

CHILDS Co., O. J., Utica, N. Y.

HOLLOWAY—See National Metal Stamping & Mfg. Co.

NATIONAL Metal Stamping & Mfg. Co., Newark, N. J. "Accurate," "Holloway," "Champion."

NORTHERN Fire Apparatus Co., Minneapolis, Minn.

TAPES

MEASURING TAPES

KEUFFEL & Esser Co., Hoboken, N. J.

LUFKIN Rule Co., Saginaw, Mich.

STARRETT Co., L. S., Athol, Mass.

TAPS

TAPS AND DIES

ACME—See American Tap & Die Co.

ADAMANTINE—See American Tap & Die Co.

AMERICAN Tap & Die Co., Greenfield, Mass. "Adamantine," "Acme," "Eagle." (See page 757.)

BAY State Tap & Die Co., Mansfield, Mass.

BESLY Co., Charles H., Chicago, Ill.

BRUBAKER & Bros., W. L., Millersburg, Pa.

BUTTERFIELD & Co., Derby Line, Vt. "Derby."

CARD Mfg. Co., S. W., Mansfield, Mass. "Paragon."

CARPENTER Tap & Die Co., J. M., Pawtucket, R. I.

CHAMPION Blower & Forge Co., Lancaster, Pa.

CONANT & Donelson Co., Conway, Mass. "Reliable."

DERBY—See Butterfield & Co.

DETROIT Twist Drill Co., Detroit, Mich. (See page 687.)

EAGLE—See American Tap & Die Co.

GEOMETRIC Tool Co., New Haven, Conn.

GREEN RIVER—See Greenfield Tap & Die Corp.

GREENFIELD Tap & Die Corp., Greenfield, Mass. "Little Giant," "Lightning," "Green River." (See page 755.)

HELMET—See Besly & Co.

HERCULES—See Wells & Son Co.

LIGHTNING—See Greenfield Tap & Die Corp.

LITTLE GIANT—See Greenfield Tap & Die Corp.

MANUFACTURERS Equipment Co., Chicago, Ill.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

PARAGON—See Card Mfg. Co.

PRATT & Whitney Co., Hartford, Conn. (See page 661.)

REED & Prince Mfg. Co., Worcester, Mass.

RELIABLE—See Conant & Donelson.

REMINGTON Tool & Machine Co., Boston, Mass.

STANDARD Tool Co., Cleveland, O.

SUPERIOR Tap Co., Charlestown, N. H.

THISTLE—See Winter Bros. Co.

WEBSTER & Perks Tool Co., Springfield, O.

WELLS & Son Co., F. E., Greenfield, Mass. "Hercules."

WINTER Bros. Co., Wrentham, Mass. "Thistle."

TOOLS

DEALERS IN TOOLS

(This is a list of Dealers in Tools who advertise in this Publication)

CHICAGO Tool & Kit Mfg. Co., 6 E. Lake St., Chicago, Ill. (See page 711.)

FRASSE & Co., Peter A., 417-21 Canal St., New York, N. Y. (See page 491.)

MONTGOMERY & Co., 105-07 Fulton St., New York, N. Y. (See page 705.)

LATHE AND PLANER TOOLS

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)

BILLINGS & Spencer Co., Hartford, Conn.

CARR—See Thompson & Son Co.

CHAMPION—See Western Tool & Mfg. Co.

CHAMPION Welding & Mfg. Co., Buffalo, N. Y. "Vulcan."

JOHNSON—See Pratt & Whitney Co.

MARCY Tool Works, Putnam, Conn.

O. K. Tool Holder Co., Shelton, Conn.

PRATT & Whitney Co., Hartford, Conn. "Johnson," "Rhodes," "Woodbridge." (See page 661.)

RHODES—See Pratt & Whitney Co.

STORTZ & Son, John, Philadelphia, Pa.

THOMPSON & Son Co., Henry G., New Haven, Conn. "Carr."

VULCAN—See Champion Welding & Mfg. Co.

WESTERN Tool & Mfg. Co., Springfield, O. "Champion."

WOODBRIDGE—See Pratt & Whitney Co.

Complete Index to Classification appears on Pages 8 to 27.

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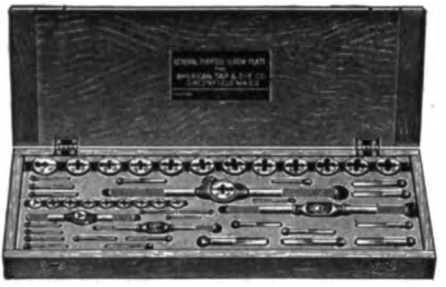
"ADAMANTINE"
General Purpose Screw-Plate

Automobiles
Lamps
Speedometer
Oilers
Motor Cycles



Bicycles
Electrical
Wind Shields
Starters

THREE SCREW-PLATES IN ONE

Most complete and useful set ever offered. Machine Screw sizes from number two to number eighteen. U. S. Standard sizes from 3/16 to ½ in. S. A. E. (A.L.A.M.) ¼ to ⅝ in. Twenty-three sizes in all. Two Tap Wrenches and two Die Stocks.

Cutting 2^{56}, 3^{48}, 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, 16^{18}, 18^{16} M. S. Sizes.
3/16^{24}, ¼^{20}, 5/16^{18}, ⅜^{16}, 7/16^{14}, ½^{13} U. S. Standard.
¼^{28}, 5/16^{24}, ⅜^{24}, 7/16^{20}, ½^{20}, 9/16^{18}, ⅝^{18}, S. A. E. (A.L.A.M.) Standard.

LIST PRICE, $24.00

Send for our Catalogue containing Ninety-six assortments of Screw-Plates.

American Tap & Die Co. Greenfield, Mass.

34.8 Miles on One Gallon of Gasoline, Average Three Days Road Test

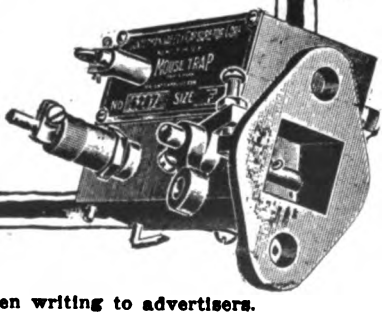
ANNOUNCEMENT

Quality and volume have won out. Owing to universal satisfaction the SUNDERMAN has given, and the enormous increase in the volume of our business, we are able to announce a TREMENDOUS REDUCTION in the price of the SUNDERMAN SAFETY CARBURETOR to a flat cash price of $5.00 for standard size F.

SUNDERMAN MOUSE TRAP CARBURETOR

ENORMOUS SAVING OF GASOLINE
INCREASED POWER
ADJUSTED TO ALL CLIMATIC CONDITIONS
EASE IN STARTING
SAFETY FROM BACKFIRE

SUNDERMAN CORPORATION
Manufacturers of Safety Carburetors
NEWBURGH, N. Y.
For All Size Cars—American or Foreign Built



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TOOLS (Continued)

MOLDERS TOOLS

DOBSON, Wm., Canastota, N. Y.
MONK, Chas., Brooklyn, N. Y.

PLANER TOOLS

(See Tools, Lathe and Planer)

PNEUMATIC TOOLS

CHICAGO Pneumatic Tool Co., Chicago, Ill.
CLEVELAND Pneumatic Tool Co., Cleveland, O.
DAYTON Pneumatic Tool Co., Dayton, O. "Green."
GREEN—See Dayton Pneumatic Tool Co.
HELWIG Mfg. Co., St. Paul, Minn.
INDEPENDENT Pneumatic Tool Co., Chicago, Ill. "Thor."
INGERSOLL-RAND Co., 11 Broadway, New York, N. Y. "Little David." (See page 737.)
KELLER Pneumatic Tool Co., Fond du Lac, Wis.
LITTLE DAVID—See Ingersoll-Rand Co.
OLDHAM & Son Co., George, Philadelphia, Pa.
PITTSBURG Pneumatic Co., Canton, O.
THOR—See Independent Pneumatic Tool Co.

THREADING TOOLS

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)
GEOMETRIC Tool Co., New Haven, Conn.
MODERN Tool Co., Erie, Pa.
RIVETT Lathe & Grinder Co., Boston, Mass

TORCHES

GASOLINE OR KEROSENE TORCHES AND FURNACES

AMERICAN Stove Co. (Ringen Div.), St. Louis, Mo.
AMERICAN Stove Co. (Reliable Stove Co. Div.), Cleveland, O. "Reliable."
BABY—See McGill Mfg. Co.
BARTHEL—See Globe Gas Light Co.
BERNZ, Otto, Newark, N. J.
BEST Light Co., Canton, O.
CARLETON Co., Boston, Mass. "Imp."
CLAYTON & Lambert Mfg. Co., Detroit, Mich.
GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Kwikheet." (See page 127.)
GLOBE Gas Light Co., Boston, Mass. "Barthel."
HANDY Torch Co., Utica, N. Y.
HAUCK Mfg. Co., Brooklyn, N. Y.
HOT BLAST—See Turner Brass Works.
IMP—See Carleton Co.
KWIKHEET—See Gemco Mfg. Co.
McGILL Mfg. Co., Valparaiso, Ind. "Baby."
QUADRIGA Mfg. Co., Chicago, Ill. "Walters."
RELIABLE—See American Stove Co.
TURNER Brass Works, Sycamore, Ill. "Hot Blast."
VOLCANO Torch & Mfg. Co., Erie, Pa.
WALL Mfg. Supply Co., P., Pittsburg, Pa.
WALTERS—See Quadriga Mfg. Co.

TRAMMELS

TRAMMEL POINTS

GOODELL-PRATT Co., Greenfield, Mass.
STARRETT Co., L. S., Athol, Mass.

TRIMMERS

WOOD TRIMMERS

(Hand Power)

BRIDGEPORT Engineering Co., Bridgeport, Conn.
FOX Machine Co., Grand Rapids, Mich.
OLIVER Machinery Co., Grand Rapids, Mich

VISES

DRILL PRESS VISES

ALEXANDER & Cox Co., Chicago, Ill.
ARMSTRONG-BLUM Mfg. Co., Chicago, Ill. "Marvel."
ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)
BLISSFIELD Motor Works, Blissfield, Mich. "Davenport."
BOWN Machine Co., Battle Creek, Mich.
CARTER & Hakes Machine Co., Winsted, Conn.
CINCINNATI-BICKFORD Tool Co., Cincinnati, O.
DAVENPORT—See Blissfield Motor Works.
GRAHAM Mfg. Co., Providence, R. I.
HOGGSON & Pettis Mfg. Co., New Haven, Conn.
LIGHTNING—See Massey Vise Co.
MADDEN Bros. Co., Rushville, Ind.
MARVEL—See Armstrong-Blum Mfg. Co.
MASSEY Vise Co., Chicago, Ill. "Lightning."
MATHER & Warchter, Cleveland, O.
NORTH Wales Machine Co., North Wales, Pa.
PLUNKET, J. E., Chicago, Ill.
SKINNER Chuck Co., New Britain, Conn.
STERLING Grinding Wheel Co., Tiffin, O.
YOST Mfg. Co., G. M., Meadville, Pa.

Complete Index to Classification appears on Pages 8 to 27.

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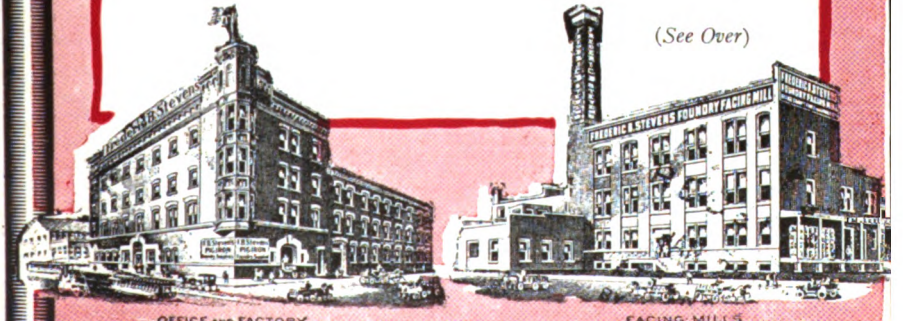

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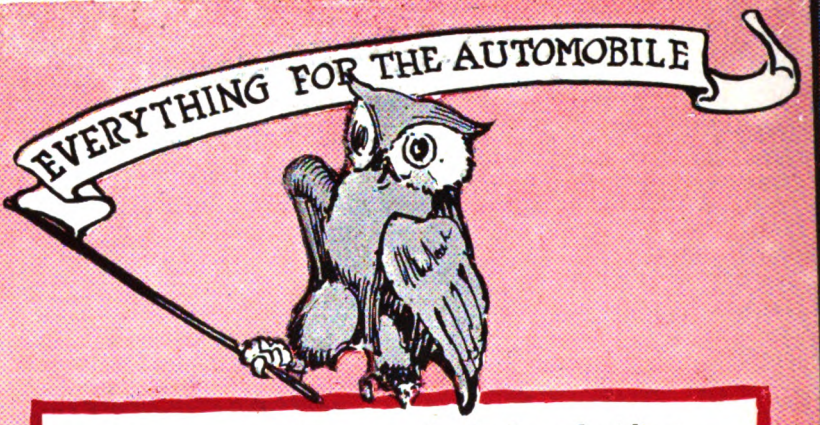

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King Kore Kompound
Columbia Parting
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Blacking
Talc
Sea Coal
Molding Sand
Rosin
Pig Iron
Coke
Cupola Furnaces
Crucibles
Core Ovens
Stevens Core Oil
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Finishing Compositions
Polishing Compositions
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Emery Glue
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Polishing Wheels
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(*See Over*)

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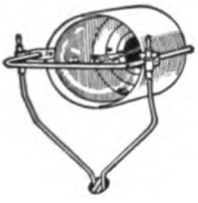

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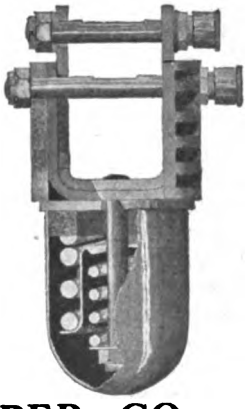

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VISES (Continued)

HAND VISES

ATHOL Machine Co., Athol, Mass. 'Boss," "Standard."

BILLINGS & Spencer Co., Hartford, Conn.

BOSS—See Athol Machine Co.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

DIKEMAN Mfg. Co., Norwalk, Conn.

GOODELL-PRATT Co., Greenfield, Mass.

K & B—See Kilborn & Bishop Co.

KILBORN & Bishop Co., New Haven, Conn. "K & B."

LIGHTNING—See Stewart Specialty Co.

LOWELL Wrench Co., Worcester, Mass.

MALLEABLE Iron Fittings Co., Branford, Conn. "Mifco."

MIFCO—See Malleable Iron Fittings Co.

MILLERS Falls Co., Millers Falls, Mass.

PHOENIX Hardware Co., Buffalo, N. Y.

SMITH, Otis A., Rockfall, Conn.

STANDARD—See Athol Machine Co.

STEWART Specialty Co., 79 E. Chestnut St., Columbus, O. "Lightning." (See page 671.)

MACHINISTS VISES

AJAX—See Bonney Vise & Tool Works.

ANCHOR—See Prentiss Vise Co.

ATHOL Machine Co., Athol, Mass. "Simpson. "Standard."

BARBOUR-STOCKWELL Co., Cambridgeport, Mass.

BARRETT Machine Tool Co., Meadville, Pa.

BONNEY Vise & Tool Works, Allentown, Pa. "Hercules," "Ajax."

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BULL DOG—See Prentiss Vise Co.

CLINCHER—See Massey Vise Co.

COLUMBIAN Hardware Co., Cleveland, O.

ERIE Tool Works, Erie, Pa.

F & R—See Fulton Machine & Vise Co.

FISHER & Norris, Trenton, N. J.

FULTON Machine & Vise Co., Lowville, N. Y. "Star," "Peerless," "F. & R."

GOODELL-PRATT Co., Greenfield, Mass.

HERCULES—See Bonney Vise & Tool Works.

HOLLANDS Mfg. Co., Erie, Pa.

HOWARD Iron Works, Buffalo, N. Y.

JERSEY—See Stanley Rule & Level Co.

LEWIS—See Prentiss Vise Co.

LIGHTNING—See Massey Vise Co.

MASSEY Vise Co., Chicago, Ill. "Clincher." "Perfect," "Lightning."

MERRILL Bros., Maspeth, N. Y.

MONARCH—See Prentiss Vise Co.

PARKER Co., Charles, Meriden, Conn.

PEERLESS—See Fulton Machine & Vise Co.

PERFECT—See Massey Vise Co.

PHOENIX Hardware Co., Buffalo, N. Y.

PITTSBURG Automatic Vise & Tool Co., Pittsburg, Pa.

PRENTISS Vise Co., New York, N. Y. "Anchor," "Bull Dog," "Lewis," "Monarch," "Rapid Transit.'

RAPID TRANSIT—See Prentiss Vise Co.

REED Mfg. Co., Erie, Pa.

ROCK Island Mfg. Co., 14th Ave. & First St., Rock Island, Ill. (See page 273.)

SIMPSON—See Athol Machine Co.

STANDARD—See Athol Machine Co.

STANLEY Rule & Level Co., New Britain, Conn. "Jersey."

STAR—See Fulton Machine & Vise Co.

YOST Mfg. Co., G. M., Meadville, Pa.

MILLING MACHINE VISES

CARTER & Hakes Machine Co., Winsted, Conn.

HENDLEY Machine Co., Torrington, Conn.

LIGHTNING—See Massey Vise Co.

MASSEY Vise Co., Chicago, Ill. "Lightning."

PATTERN MAKERS AND WOOD-WORKERS VISES

ABERNATHY Vise & Tool Co., Chicago, Ill.

ATHOL Machine Co., Athol, Mass. "Simpson."

AYES & Co., Chicago, Ill.

BARBOUR-STOCKWELL Co., Cambridgeport, Mass. "Chandler & Washburn."

BLAKE—See Prentiss Vise Co.

BONNEY Vise & Tool Works, Allentown, Pa.

CHANDLER & WASHBURN—See Barbour-Stockwell Co.

CLINCHER—See Massey Vise Co.

COLUMBIAN Hardware Co., Cleveland, O.

FISHER & Norris, Trenton, N. J.

LIGHTNING—See Massey Vise Co.

MASSEY Vise Co., Chicago, Ill. "Lightning." "Clincher."

OLIVER Machinery Co., Grand Rapids, Mich.

PARKER Co., Charles, Meriden, Conn.

PITTSBURG Automatic Vise & Tool Co., Pittsburg, Pa.

PRENTISS Vise Co., New York, N. Y "Blake."

ROCK Island Mfg. Co., 14th Ave. & First St., Rock Island, Ill. (See page 273.)

SIMPSON—See Athol Machine Co.

TOLES Co., W. C., Chicago, Ill.

WYMAN-GORDON Co., Worcester, Mass. (See Back Bone.)

YOST Mfg. Co., G. M., Meadville, Pa.

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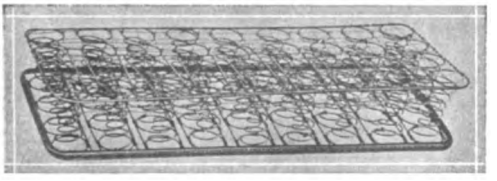

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VISES (Continued)

PIN VISES

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BILLINGS & Spencer Co., Hartford, Conn.
BRAUNSDORF-MUELLER Co., Elizabeth, N. J.
GOODELL-PRATT Co., Greenfield, Mass.
LOWELL Wrench Co., Worcester, Mass.
STARRETT Co., L. S., Athol, Mass.

PIPE VISES

ARMSTRONG Mfg. Co., Bridgeport, Conn.
ATHOL Machine Co., Athol, Mass.
BLAKE—See Prentiss Vise Co.
DIKEMAN Mfg. Co., Norwalk, Conn.
ERIE Tool Works, Erie, Pa.
FISHER & Norris, Trenton, N. J.
HOLLANDS Mfg. Co., Erie, Pa.
IDEAL—See Orange Machine & Mfg. Co.
MAGIC—See Prentiss Vise Co.
MARK Mfg. Co., Chicago, Ill.
MASSEY Vise Co., Chicago, Ill. "Perfect."
MONARCH—See Prentiss Vise Co.
ORANGE Machine & Mfg. Co., Orange, N. J. "Ideal."
OSWEGO Tool Co., Oswego, N. Y.
PARKER Co., Charles, Meriden, Conn.
PERFECT—See Massey Vise Co.
PHOENIX Hardware Co., Buffalo, N. Y.
PITTSBURG Automatic Vise & Tool Co., Pittsburg, Pa.
PRENTISS Vise Co., New York, N. Y. "Blake," "Monarch," "Rex," "20th Century," "Shepard," "Magic."
REED Mfg. Co., Erie, Pa.
REX—See Prentiss Vise Co.
ROCK Island Mfg. Co., 14th Ave. & First St., Rock Island, Ill. (See page 273.)
SAUNDERS Sons, D., Yonkers, N. Y.
SHEPARD—See Prentiss Vise Co.
20TH CENTURY—See Prentiss Vise Co.
WALWORTH Mfg. Co., Boston, Mass.
WELLS & Son Co., F. E., Greenfield, Mass.
WHITTINGTON-VAUGHN Co., Easton, Pa.
YOST Mfg. Co., G. M., Meadville, Pa.

PLANER VISES

HENDEY Machine Co., Torrington, Conn.
LIGHTNING—See Massey Vise Co.
MASSEY Vise Co., Chicago, Ill. "Lightning."

SPECIAL AND PORTABLE VISES

BONNEY Vise & Tool Works, Allentown, Pa.
F & R—See Fulton Machine & Vise Co.
FULTON Machine & Vise Co., Lowville, N. Y. "F & R."
PARKER Co., Charles, Meriden, Conn.
PITTSBURG Automatic Vise & Tool Co., Pittsburg, Pa.
ROCK Island Mfg. Co., 14th Ave. & First St., Rock Island, Ill. (See page 273.)

WOODWORKERS VISES

(See Vises, Patternmakers and Woodworkers)

WAYS

BALANCING WAYS

DEFIANCE Machine Works, Defiance, O.
ROCKFORD Tool Co., Rockford, Ill.

WHEELS

BUFFING AND POLISHING WHEELS

CHICAGO Wheel & Mfg. Co., Chicago, Ill.
DAY Mfg. Co., S. A., Buffalo, N. Y.
DIVINE Bros. Co., Utica, N. Y.
EASTERN Felt Co., Winchester, Mass.
EASTERN Polishing Supply Co., Easton, Pa.
FOOT Mfg. Co., Jersey City, N. J.
WILLIAMSVILLE Buff Mfg. Co., Danielson, Conn.

GRINDING WHEELS

ABRASIVE Material Co., Philadelphia, Pa.
AMERICAN Emery Wheel Works, Providence R. I.
BAY State Emery Wheel Co., Worcester, Mass.
BRIDGEPORT Safety Emery Wheel Co., Bridgeport, Conn.
BUFFALO Emery Wheel Co., Buffalo, N. Y.
CARBORUNDUM Co., Niagara Falls, N. Y.
CHICAGO Wheel & Mfg. Co., Chicago, Ill.
CORTLAND Corundum Wheel Co., Cortland, N. Y.
DETROIT Grinding Wheel Co., Detroit, Mich. "Hart."
ELECTRIC Emery Wheel Co., Newark, N. J
HART—See Detroit Grinding Wheel Co.
NATIONAL Grinding Wheel Co., Buffalo, N. Y.
NORTON Co., Worcester, Mass.
PENNSYLVANIA Grinding Wheel Co., Philadelphia, Pa.
PIKE Mfg. Co., Pike, N. H.
PITTSBURG Grinding Wheel Co., Rochester, Pa.
SAFETY Emery Wheel Co., Springfield, O.
SPRINGFIELD Mfg. Co., Bridgeport, Conn.
STAR Corundum Wheel Co., Detroit, Mich.

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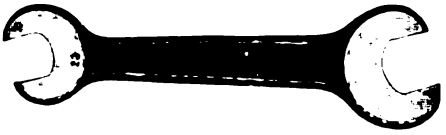
Triple Diamond Files

Forged Steel Wrenches



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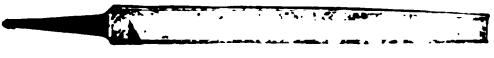

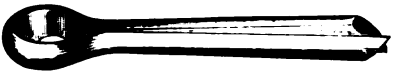

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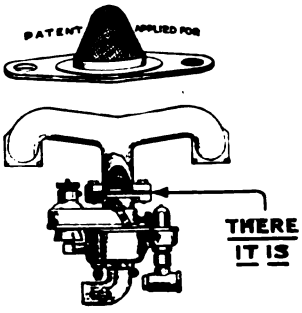

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VITRIFIED Wheel Co., Westfield, Mass.

WALTHAM Emery Wheel Co., Waltham, Mass.

POLISHING WHEELS

(See Wheels, Buffing and Polishing)

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REMINGTON Tool & Machine Co., Boston, Mass.

WRENCHES

NUT AND BOLT WRENCHES

AGNER Co., Raymond C., Burlington, Wis.

ALLAN & Co., A. C., Morris, Ill.

ALLEN Wrench & Tool Co., Providence, R. I.

ALDERMAN—See Mossberg Co.

AMERICAN Forge & Machine Co., Canton, O.

AMERICAN Pulley Co., Philadelphia, Pa.

AMERICAN Thermo Ware Co., New York, N. Y. (Importers.) "Hercules."

ARMSTRONG Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 707.)

ATHOL Machine Co., Athol, Mass.

AUTO CLE—See Mossberg Co.

AUTO KING—See Azadian Gauge Mfg. Co.

AUTO QUEEN—See C. M. B. Wrench Co.

AUTOMATIC Wrench Mfg. Co., Boston, Mass. "Barnsley."

AZADIAN Gauge Mfg. Co., Syracuse, N. Y. "Auto King."

B. & C.—See Bemis & Call Hardware & Tool Co.

BARCALO Mfg. Co., Buffalo, N. Y.

BARNES Tool Co., New Haven, Conn.

BARNSLEY—See Automatic Wrench Mfg. Co.

BAY STATE AUTOKIT—See Cutter, Geo. A.

BECCO—See Michigan Motor Specialties Co.

BEMIS & Call Hardware & Tool Co., Springfield, Mass. "B. & C."

BILLINGS & Spencer Co., Hartford, Conn.

BONNEY Vise & Tool Works, Allentown, Pa.

BORNSTEIN & Co., Ipswich, Mass.

BOSTON Wrench Co., Boston, Mass.

BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BRIDGEPORT Hardware Mfg. Corp., Bridgeport, Conn.

BUFFUM Tool Co., Louisiana, Mo.

C. M. B. Wrench Co., Garwood, N. J. "Silver King." "Auto Queen."

CHAMBERLAIN Wrench Co., Geneva, Ill.

CHAMPION—See Syracuse Wrench Co.

COCHRAN Pipe Wrench Mfg. Co., Chicago, Ill. "Speednut."

COES Wrench Co., Worcester, Mass.

CRESCENT Tool Co., Jamestown, N. Y.

CRONK & Carrier Mfg. Co., Elmira, N. Y.

CUTTER, Geo. A., Taunton, Mass. "Bay State Autokit," "Stickit." (See page 765.)

DIAMOND—See Ferodowill Mfg. Co.

DIAMOND—See Mossberg Co.

DUDLY Tool Co., Menominee, Mich.

EAGLE Claw Wrench Co., Rockford, Ill.

EMPIRE—See Hjorth & Co.

ERIE Stamping & Mfg. Co., Erie, Pa. "Esco."

ESCO—See Erie Stamping & Mfg. Co.

FERODOWILL Mfg. Co., St. Paul, Minn. "Diamond."

GEMCO Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 127.)

GLOBE Machine & Stamping Co., 1250 W. 76th St., Cleveland, O. (See page 121.)

GLOBE Wrench Co., Ipswich, Mass.

GRIPSALL—See Mossberg Co.

GUERNSEY, C. C., Derry, N. H.

HARRIS & Reed Mfg. Co., Chicago, Ill.

HERBRAND Co., Fremont, O. (See page 679.)

HERCULES—See American Thermo Ware Co

HEXALL—See Sedgley, R. F.

HILL Pump Valve Co., Chicago, Ill. "Utility."

HJORTH & Co., Wm., Jamestown, N. Y "Empire."

IMPERIAL Tool Co., Bloomington, Ill.

INDIANAPOLIS Drop Forging Co., Indianapolis, Ind.

K & S—See Sedgley, R. F.

KEYSTONE Mfg. Co., Buffalo, N. Y. "Westcott."

KILBORN & Bishop Co., New Haven, Conn. "Saxon."

LAKESIDE Forge Co., Erie, Pa.

LAMSON & Sessions Co., Cleveland, O.

LANE, Will B., 180 N. Dearborn St., Chicago, Ill. "Unique." (See page 775.)

LOWELL Wrench Co., Worcester, Mass.

LOWENTRAUT Mfg. Co., P., Newark, N. J "U. S."

MARVEL Accessories Mfg. Co., W. Sixth St. & Lakeside Ave., Cleveland, O. (See page 775.)

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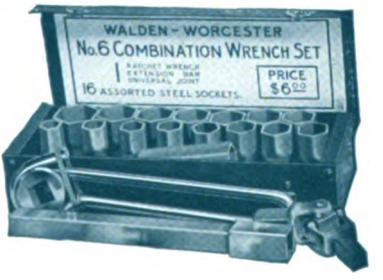
Sizes, 17-32 19-32 21-32 23-32
25-32 29-32 31-32 13-32 in.

Fibre Box 10:3-4 x 2:3-4 x 2:1-2 Net Weight 3:1-2 lbs.

THE IDEAL SET
FOR OWNERS USE.
SOCKETS
COVER ALL STANDARD SIZES.

Contains No. 511 Ratchet Wrench, 9 in.
Extension Bar
Universal Joint
7-8 Spark Plug Socket
15 Hex Sockets
Sizes 17-32in. to 1:9-32 in.
To fit cap screws from 5-16 to 1 in.
U. S. S. Nuts 1-4 to 3-4 in.
A. L. A. M. 5-16 to 7-8 in.



Vulcanized Fibre Box 10:3-4 x 4 x 2:1-2 Net Weight 5 lbs

IDEAL
COMPLETE WRENCH EQUIPMENT
BIGGEST
POSSIBLE VALUE IN
STANDARD GUARANTEED TOOLS

Contains No. 511 Ratchet Wrench, 9 in.
Extension Bar, 9 in.
Universal Joint
5 Open End Wrenches
10 Openings 1-4 to 1 in.
27 Hex. Sockets 5-16 to 1:9-32
11 Sq. " 13-32 to 1:9-32
7-8 Spark Plug Socket
Combination Offset and Tee Handle
Cotter Pin Extractor

Vulcanized Fibre Box 14 x 6:5-8 x 2:1-2 Net Weight 10 lbs.

WALDEN WORCESTER WRENCHES

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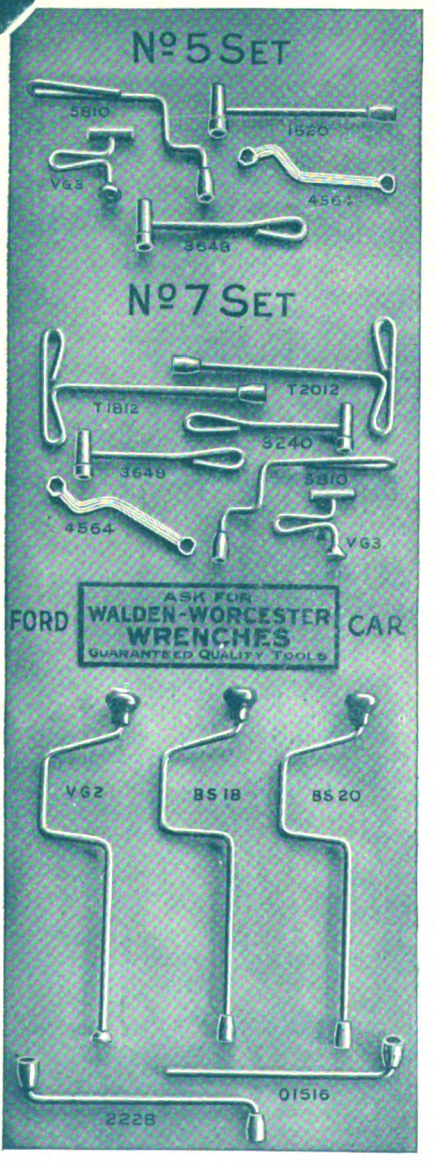

Our directory of wrenches for use on Ford Cars is the result of having actually tried out each wrench on the part named to insure proper clearance around the nut, and working space for the handles. The object to obtain full efficiency for the tool, and use of the same wrench on as many different parts as possible.

DIRECTORY OF WRENCHES

FORD CAR

Adjustment - fan, bolt	3648
Bands - slow, low, brake, reverse	4564
Bearing - main	3648
Body bolts	2228
Bolts on engine	T 1812 and B.S.18
Bracket nut, controller shaft	3240
Brake bands	4564
Case, differential stud nuts	B.S.18-T1812
Clamp stud nuts on manifold	T1812-B.S.18
Connecting rods. (including 4th)	5810
Controller shaft bracket nuts	3240
Cover, - transmission, bolts	B.S.18-T1812
Crank case cover (lower cover)	3240
Cylinder head bolts	3240-T2012-B.S.20
Dash board nuts	T2012
Differential case stud nuts	B.S.18-T1812
Differential drive gear cap screw	3240
Drive gear. differential, cap screw	3240
Drive shaft housing stud nuts	3240-T2012
Drive shaft pinion	01516
Engine bolts	B.S.18-T1812
Fan adjusting bolt	3648
Fan bracket bolt	3648
Fourth connecting rod	5810
Housing bolts, rear axle	3240
Housing stud nuts, drive shaft	3240-T2012
Hub bolt nuts	2228
Intake, water, screw	3240-T2012
Joints, universal	B.S. 18-T1812
Low speed bands	4564
Lower cover, crank case	3240
Main bearing bolt	3648
Manifold clamp stud nuts	T1812-B.S.18
Outlet, water, cap screws	3240-T2012
Pinion drive shaft	01516
Rear axle housing nuts	3240
Reverse bands	4564
Slow speed bands	4564
Spindle arm nuts	2228
Spindle bolt and nut	3648
Spindle connecting rod bolt	3648
Transmission cover nuts	B.S.18-T1812
Universal joints	B.S.18-T1812
Water intake cap screws	3240-T2012
Water outlet cap screws	3240-T2012

Note: 1620 - Tomahawk may be used in place of 3240, the only advantage, the socket on end is used in spinning nuts off or on. On several parts more than one wrench is listed. The offset gives longer leverage. The tee handle or brace may be more efficient.

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WALDEN WORCESTER WRENCHES

No. 7 Set of Service Wrenches for Ford Car - Complete, $2.50

For repairing and overhauling Ford Cars this is a most complete set of real tools which will be valued by every good mechanic. Every tool has been proven out in actual service for this work. All parts of these wrenches are made of steel, the sockets are machine turned and broached 1-64 over size making a perfect fit for the nuts. Look for the name WALDEN - WORCESTER which is stamped on all our wrenches, this is your guarantee.

No. 3240: Price each .30

Cylinder Head Bolts
Rear axle housing nuts
Water intake and outlet cap screw
Rear axle nuts
Crank case lower cover
Drive shaft housing stud nuts
Differential drive gear cap screw
Controller shaft bracket nuts

No. 3648: Price each .30

Main bearing bolt
Fan adjusting bolt
Fan bracket bolt
Spindle connecting rod bolt
Spindle bolt and nut

T-1812: Price each .40

Transmission cover bolts and nuts
Manifold clamp stud nuts
Engine bolts
Fan adjusting nuts
Universal Joints
Differential case studs

T-2012: Price each .40

Cylinder head bolts
Water intake and outlet
Dash bolts
Drive shaft stud nuts

No. 5810: Price each .35

FOURTH CONNECTION

5-8 in. hex socket, special tool for all connecting rods and the only wrench which will fit the fourth connection.

No. 4564: Price each .50

Brake Bands
Reverse Bands
Low Speed Bands

The clearance around the nuts on the Brake and Reverse Bands is very limited. This wrench is especially designed for full efficiency on these adjustments.

No. V. G. 3: Price each .30

This is the only all steel Valve Grinder on the market. The 5-8 in. bar handle swivels on a cone bearing; the socket is shaped to fit the valve head and fitted with hardened steel pins. Used for:

Grinding all Ford Valves.

No. 5 Set of Service Wrenches for Ford Car - Complete, $1.75

1520

Covers same parts as 3240.
Extra socket on handle a convenience in spinning nuts off and on.

3648:
5810:
4564:
VG3:

All Steel Tools Made for Real Service

No. V. G. 2 Price each .65

Long Shank Brace Grinder
Grinding valves

B. S. 18 Price each .65

9-16" Long Shank Brace
Transmission cover bolt nuts
Engine bolts, etc.

B. S. 20 Price each .65

5-8" Long Shank Brace
Cylinder head bolts, etc.

2228 Price each .40

11-16 & 7-8" Double Socket Offset
Hub and body bolts
Spindle arm nuts

01516 Price each .40

15-16" Offset Socket Wrench
Drive shaft pinion

WALDEN - WORCESTER original designs have been copied but none of the imitators have yet covered all the fine points in design. Your protection is to look for the name ——

WALDEN - WORCESTER

stamped on every wrench and box. Do not accept substitutes.

There are no "come backs" on WALDEN - WORCESTER - Wrenches They are absolutely guaranteed.

WALDEN WORCESTER WRENCHES

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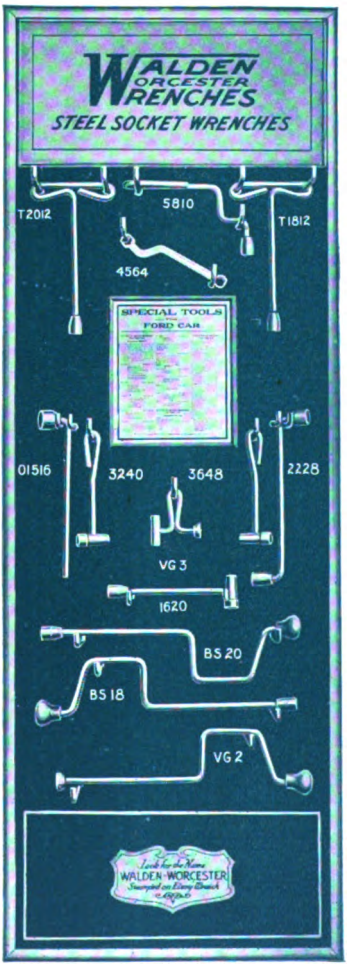
No. 78 Display and Stock Set.
Special Wrenches for use on Ford Car.

Making

Your

Business



A practical profit and sales making co-operative business building promotion policy, which makes it possible for all dealers to sell wrenches that will fit any nut or bolt in any place, and from any position on Ford cars.

ATTRACTIVE DISPLAY BOARD.

Guaranteed Service

Proven Utility Wrenches.

A million buyers of wrenches for Ford cars—owners and repairers, have been securing their wrenches one at a time and from a number of dealers.

No one dealer cared to stock the large number of different makes of wrenches that would meet every demand. The outcome was, no one dealer did much business, or was able to make more than a small profit.

We have solved the stock and profit problems and are now supplying the trade, a complete line of wrenches for Ford cars that are unequalled—in service giving requirements, they meet every demand.

To help the dealer, we are furnishing a display board that is an added attraction in any store. It is a constant working salesman, it commands attention, and by referring to the information sheet in the center, the customer instantly learns the exact wrench required for any job. It is a saver of clerk's time, shelf room, and it brings the business. It costs the dealer nothing

THE BOARD

This is the handsomest wrench display board we have seen. The face of the board is covered with sheet metal, which is lithographed in black and golden rod. The center panel in black and white contains the Directory and full information regarding all the different wrenches. The number of each wrench appears on the board as shown in the picture. The hooks are held by nut and check nut and will remain in permanent position.

No. 78 Display and Stock Set.

6	T-2012	.40	$2.40
6	5810	.35	2.10
6	T-1812	.40	2.40
6	4564	.50	3.00
6	01516	.40	2.40
6	3240	.30	1.80
6	No.3V.G.	.30	1.80
6	3648	.30	1.80
6	2228	.40	2.40
6	1620	.35	2.10
6	B.S.18	.65	3.90
6	B.S.20	.65	3.90
6	No.2V.G.	.65	3.90
		Total	$33.90

Special Net prices to the trade.

WALDEN MFG. CO., (69 Central St.) Worcester, Mass.

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WALDEN WORCESTER WRENCHES

TEE AND OFFSET HANDLE SOCKET WRENCHES

PRACTICAL WRENCHES FOR EVERY SERVICE

Hexagonal sizes.

7/16, 1/2, 9/16, 19/32, 5/8, 11/16, 3/4, 25/32, 13/16, 7/8,

The size of each wrench is stamped on the handle. The Sizes corresponding with the short diameter of the nut or bolt head to be fitted.

DEALERS' DISPLAY STOCK BOARD.

Sockets are machine turned and broached to 1-64 in. over listed sizes. Handles are special steel rod. Sockets are fastened to the rod by our own special process and are guaranteed not to turn or twist off.

Offset Socket Wrench

7 in. handle.
Price each, all sizes, 35c.

Stock No. OFF.

Short Shank Tee Handle

6 in. handle, 6 in. shank.
Each, all sizes, 35c.

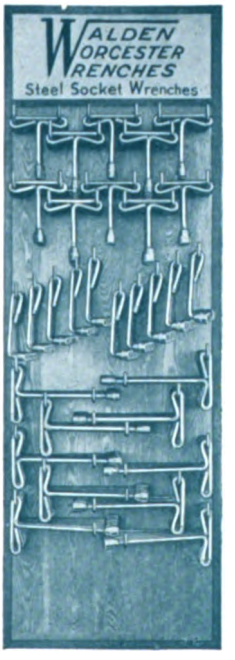
Stock No. SST.

Long Shank Tee Handle

6 in. handle, 12 in. shank.
Each, all sizes, 40c.

Stock No. LST.

WALDEN WORCESTER WRENCHES



No. 180 Set.

This board and stock properly displayed in your store will sell these wrenches. The outfit is fully as attractive as the illustration.

You need the full assortment of sizes. Six of each size is not too large a stock. The two lengths of Tee Handles will meet unlimited requirements.

We can make up special lengths and shapes at slight additional cost. You can secure special wrench orders.

The board contains one hundred and eighty wrenches. Three types—ten sizes of each type—making thirty type sizes and stock of six each.

One price for each type covering all sizes makes it unnecessary for salesmen to carry complicated price list. This condition will make for more ready sales.

List Price on No. 180 Set $66.00. Get our trade discount and compare prices. You will then send in your order for the Set.

RECOGNIZED STANDARD TOOLS.

Demanded by Every Knowing Mechanic.

FIT HEX. HEAD SIZE	7/16	1/2	9/16	19/32	5/8	11/16	3/4	25/32	13/16	7/8
FIT CAP SCREW SIZE	1/4	5/16	3/8		7/16		1/2		9/16	5/8
FIT A.L.A.M. SIZE	1/4	5/16	3/8			7/16	1/2			9/16
FIT U.S.S. NUT SIZE		1/4		5/16		3/8		7/16		1/2

When ordering please use stock number and also give short diameter nut or bolt head.

WALDEN MFG. CO., (69 Central St.) Worcester, Mass.

WALDEN WORCESTER WRENCHES

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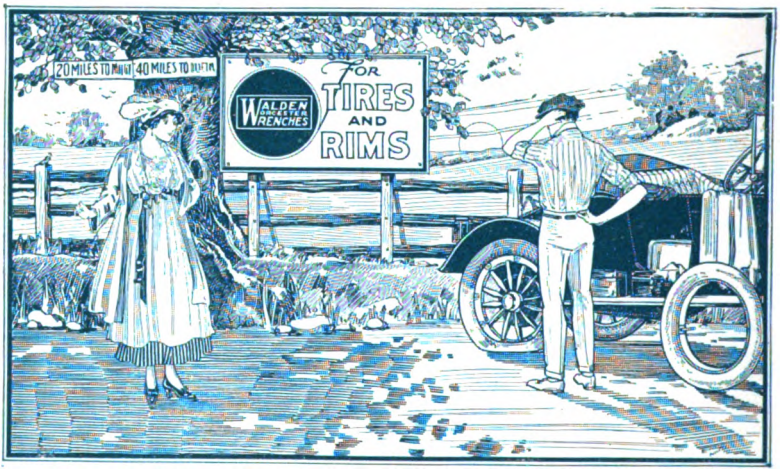
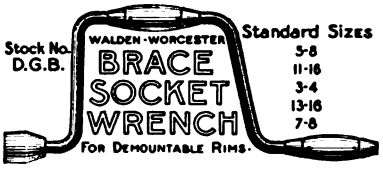
WALDEN WORCESTER WRENCHES



ROAD TIRE CHANGES ARE UNPLEASANT AT BEST. GOOD TOOLS ARE MOST HELPFUL. **WALDEN-WORCESTER** TIRE AND RIM WRENCHES ARE COMPLETE, SOLID TOOLS. NO LOOSE PARTS. ALWAYS READY AND DEPENDABLE FOR THIS EMERGENCY WORK. EVERY MOTORIST SHOULD CARRY ONE OF THESE WRENCHES.

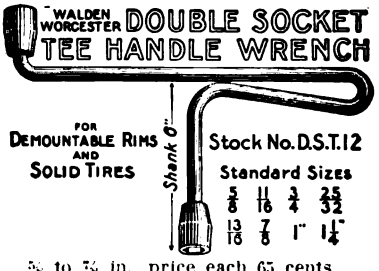
TIRE AND RIM WRENCHES.

Sockets are machine turned and broached to size, applied to the rod by our special process and guaranteed not to twist or shear off.



Price Each **65c.**

This is the popular tool for use on rims The only all steel brace on the market. The swivel handles are pressed steel, the wrench is nickel finish.
You can buy cheaper tools but the best is none too good for this emergency work.
Look for the name WALDEN-WORCESTER on all wrenches.
Sizes to fit all standard rims carried in stock.



5/8 to 7/8 in. price each 65 cents.
1 & 1 1/4 in. price each 75 cents
Handle 12 inches. Shank 6 inches
Both sockets are same size. Socket on end of handle designed to give full (12 inches) leverage to release or tighten nuts. The other socket makes the tool a perfect Tee Handle Wrench. For quick work left hand on shank, right hand on socket end of handle and it is easy to spin the nut off.

The two types illustrated are the best possible tools for rims and tires. The choice for demountable rims is personal preference — both tools are most efficient.

The Brace has been the most popular seller, possibly because the type is better known. The Double Socket Tee Handle using one socket has the crank motion, when using the end socket more leverage than the brace. It is however, the tool we recommend for solid tire work.

When ordering please use stock number and also give short diameter nut or bolt head.

WALDEN WORCESTER WRENCHES

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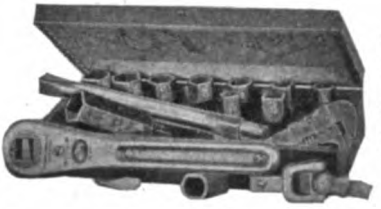
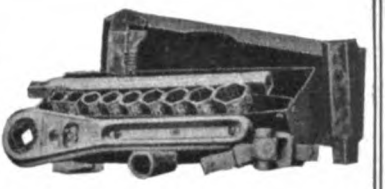


Wrench Set No. 15—For all Ford nuts—Contains ratchet socket wrench, tubular extension bar, universal joint.



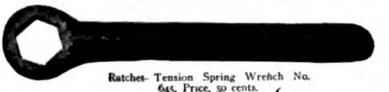
Contains ratchet socket wrench, tubular extension bar, universal joint, screw driver bit, spark plug wrenches and sockets from 17/32 to 31/32. Packed in wooden or fibre case, $5.00.

Open-end Wrench Set No. 19—Ten openings to fit the majority of Ford nuts. A fine set of hardened tools in 3 finishes. Price, with canvas case, $1.26, $1.16, $0.86, according to finish.

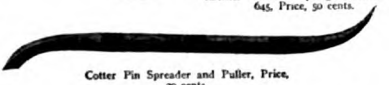
Valve Grinder No. 605. Price, 25 cents.

Reverse and Brake Pedal Tension Spring Wrench No. 640, Price, 12 cents.

Same as above also fits cylinder head and other ⅝" nuts, No. 641, Price, 16 cents.



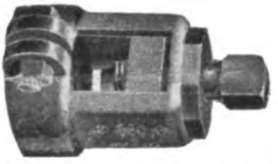
Ratchet Tension Spring Wrench No. 645, Price, 50 cents.



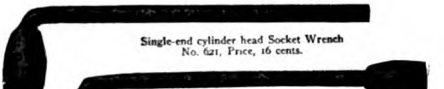
Cotter Pin Spreader and Puller, Price, 20 cents.

Heavy-duty Socket Set No. 17—Ten openings. Special for 1915 Fords. Price in canvas case, $2.06.

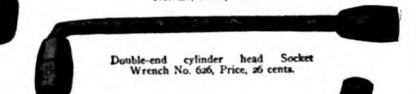
Socket Wrench Set No. 30—in fibre case, Price, $4.00.



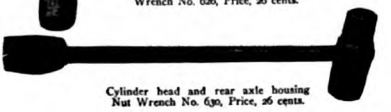
Adjustable Wheel Puller Price, 56 cents



Single-end cylinder head Socket Wrench No. 621, Price, 16 cents.



Double-end cylinder head Socket Wrench No. 626, Price, 26 cents.



Cylinder head and rear axle housing Nut Wrench No. 630, Price, 26 cents.

Connecting Rod Wrench, Price, 28 cents

Hub Cap Wrench No. 650, Price 10 cents.

Valve Lifter. Price, 80 cents

Send for complete illustrated catalog No. 181C of Wrenches and Tools for automobiles.

Frank Mossberg Company

ATTLEBORO, MASS.

Wrenchsmiths for 19 Years

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WRENCHES (Continued)

NUT AND BOLT WRENCHES (Continued)

MICHIGAN Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco." (See page 671.)

MOORE Drop Forging Co., Springfield, Mass.

MOSSBERG Co., Frank, Attleboro, Mass. "Sterling," "Diamond," "Alderman," "National," "Auto Cle," "Gripsall." (See page 773.)

NATIONAL—See Mossberg Co.

NATIONAL Jack & Mfg. Co., Chicago, Ill.

NEW Britain Mfg. Co., New Britain, Conn.

NEW England Forge Co., Worcester, Mass.

NIAGARA Falls Metal Stamping Works, Niagara Falls, N. Y. "Pokitrenchiz."

P & R Wrench Co., Grand Rapids, Mich.

PACKER Auto Specialty Co., Chicago, Ill. "Ray."

PECK, Stow & Wilcox Co., Southington, Conn. "Pexto."

PEXTO—See Peck, Stow & Wilcox Co.

PERFECT HANDLE—See Smith & Co.

PICK-UP—See New Britain Mfg. Co.

POKITRENCHIZ—See Niagara Falls Metal Stamping Works.

RAY—See Packer Auto Specialty Co.

REX Wrench Co., Boston, Mass.

RONSON Specialty Co., Newark, N. J.

S. & I. Co., Springfield, Mass.

SAXON—See Kilborn & Bishop Co.

SCHOENBORN, A. J., Greenleaf, Kans.

SCHOLLER Mfg. Co., Buffalo, N. Y.

SEDGLEY, R. F., 2311-13 N. 16th St., Philadelphia, Pa. "K & S," "Hexall." (See page 775.)

SHAW Propeller Co., Boston, Mass.

SHAWVER Co., Springfield, O. "Springfield."

SILVER KING—See C. M. B. Wrench Co

SMITH & Co., H. D., Plantsville, Conn. "Perfect Handle."

SPEEDNUT—See Cochran Pipe Wrench Mfg. Co.

SPRINGFIELD—See Shawver Co.

STARRETT Co., L. S., Athol, Mass.

STERLING—See Mossberg Co.

STICKIT—See Cutter, Geo. A.

SYRACUSE Wrench Co., Syracuse, N. Y. "Champion." (See page 765.)

TRIMO—See Trimont Mfg. Co.

TRIMONT Mfg. Co., 55 Amory St., Roxbury, Mass. "Trimo." (See page 775.)

TURNER & Deegan, Bristol, Conn.

U. S.—See Lowentraut Mfg. Co.

UNIQUE—See Lane, Will B.

UTILITY—See Hill Pump Valve Co.

VLCHEK Tool Co., Cleveland, O.

WAKEFIELD, Clarence E., Worcester, Mass.

WALDEN Mfg. Co., Worcester, Mass. (See pages 767 to 772.)

WESTCOTT—See Keystone Mfg. Co.

WHITAKER Mfg. Co., Chicago, Ill. (See page 765.)

WHITMAN & Barnes Mfg. Co., Akron, O.

WILLIAMS & Co., J. H., Brooklyn, N. Y.

PIPE WRENCHES

AMERICAN Forge & Machine Co., Canton, O.

ARMSTRONG Mfg. Co., Bridgeport, Conn.

BONNEY Vise & Tool Works, Allentown, Pa. "Vixen."

COCHRAN Pipe Wrench Mfg. Co., Chicago, Ill

DUDLY Tool Co., Menominee, Mich

EMPIRE—See Hjorth & Co.

ERIE Stamping & Mfg. Co., Erie, Pa. "Esco."

ERIE Tool Works, Erie, Pa.

ESCO—See Erie Stamping & Mfg. Co.

HJORTH & Co., Wm., Jamestown, N. Y "Empire."

IDEAL—See Kroeschell Bros. Co.

IRELAND Pipe Wrench Co., Boston, Mass.

KEYSTONE Mfg. Co., Buffalo, N. Y. "Westcott."

KROESCHELL Bros. Co., Chicago, Ill. "Ideal."

LEADER—See Ripley Pipe Wrench Co.

LUTZ-WEBSTER Engineering Co., Philadelphia, Pa.

MOORE Drop Forging Co., Springfield, Mass

OSWEGO Tool Co., Oswego, N. Y.

PERFECT HANDLE—See Smith & Co.

RIPLEY Pipe Wrench Co., Ripley, N. Y "Leader."

ROEBLING'S Sons Co., John A., Trenton, N. J.

SHAW Propeller Co., Boston, Mass.

SMITH & Co., H. D., Plantsville, Conn. "Perfect Handle."

STILLSON—See Walworth Mfg. Co.

TRIMO—See Trimont Mfg. Co.

TRIMONT Mfg. Co., 55 Amory St., Roxbury, Mass. "Trimo." (See page 775.)

VIXEN—See Bonney Vise & Tool Works.

WAKEFIELD, Clarence E., Worcester, Mass

WALWORTH Mfg. Co., Boston, Mass. "Stillson."

WELLS & Son Co., F. E., Greenfield, Mass.

WESTCOTT—See Keystone Mfg. Co.

TAP AND REAMER WRENCHES

ADAMANTINE—See American Tap & Die Co.

ALERT Tool Co., Philadelphia, Pa.

ALEXANDER & Cox Co., Chicago, Ill.

AMERICAN Tap & Die Co., Greenfield, Mass. "Adamantine." (See page 757.)

ARMSTRONG Mfg. Co., Bridgeport, Conn.

BAY State Tap & Die Co., Mansfield, Mass.

BERGMAN Tool Mfg. Co., Buffalo, N. Y.

BESLY & Co., Charles H., Chicago, Ill.

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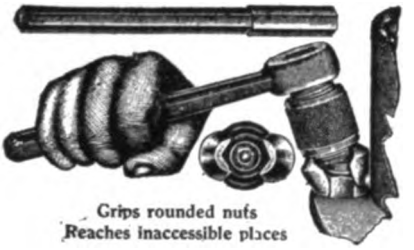

WOULD YOU USE

a monkey wrench with a separate handle and a box full of loose jaws to fit the various sized nuts? It's a hundred years behind the times, yet that is just what you are doing when you carry a box full of loose sockets, and then you are up against it on odd sized, rounded or battered nuts.

The Marvel Adjustable Socket Wrench *grips like a vise*—mutilated, *rounded* or *odd size nuts*. Gets into places *inaccessible* to the ordinary socket wrench.

It is *drop forged tool steel*, ten times stronger than cast or stamped socket wrench.

Takes the place of a $10.00 socket wrench set and consists of *only three parts*. Price $3.00

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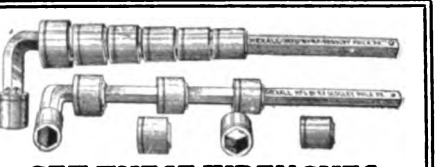
Cleveland, Ohio



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Good to Use—Easy to Sell

K & S—a complete ratchet wrench set—case hardened steel sickets from 5/16" to ⅝", 2 screw driver bits, 6" extension bar, 7" ratchet handle—complete..$2.50

"Hexall"—7 sockets made of case hardened bar steel from 5/16" to ⅝"—handle made from ½" hexagon steel—complete $1.50

Both sets fully guaranteed—any broken part repaired free.

Send for trade discounts.

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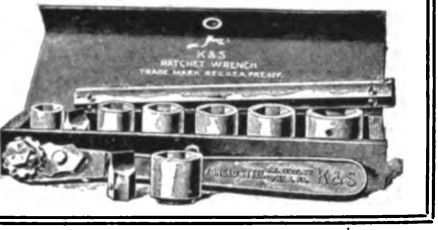

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Machine made throughout. Made of the best material obtainable. The sockets in both the standard and Ford sets are turned from Bessemer steel and case hardened and are warranted not to break or spread. Has no equal for close work.

THE FORD SET Contains:
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2 Screw-driver bits.
1 Extension bar 7 inches in length.
SIX SOCKETS to fit all nuts and bolt heads on Ford car, including the cylinder head.
Price in leather case, $3.00.

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1 Handle 7 inches in length.
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7 Sockets to fit semi-finished Hex. nuts as follows:
U. S. Standards from 1-4 in. to 1-2 in.
A. L. A. M. Standards from 5-16 in. to 11-16 in.
Cap screw heads from 5-16 in to 5-8 in.
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Trimo Superior Auto Wrenches

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Trimo Auto Pipe Wrench

Narrow Jaws
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Made in 6", 8", 10" Sizes,
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Trimo Auto Monkey Wrench
All-Steel
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BRAUNSDORF-MUELLER Co., Elizabeth, N. J.

BRUBAKER & Bros., W. L., Millersburg, Pa.

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CARD Mfg. Co., S. W., Mansfield, Mass. "Horsfield."

CARPENTER Tap & Die Co., J. M., Pawtucket, R. I. "Nichols."

CONANT & Donelson Co., Conway, Mass. "Reliable."

DIKEMAN Mfg. Co., Norwalk, Conn.

GOODELL-PRATT Co., Greenfield, Mass.

GREEN RIVER—See Greenfield Tap & Die Corp.

GREENFIELD Tap & Die Corp., Greenfield, Mass. "Little Giant," "Lightning," "Green River." (See page 755.)

HART Mfg. Co., Cleveland, O.

HERCULES—See Wills & Son Co.

HOLDFAST—See West Haven Mfg. Co.

HORSFIELD—See Card Mfg. Co.

KEYSTONE Mfg. Co., Buffalo, N. Y.

LIGHTNING—See Greenfield Tap & Die Corp.

LITTLE GIANT—See Greenfield Tap & Die Corp.

MORSE Twist Drill & Machine Co., New Bedford, Mass.

NICHOLS—See Carpenter Tap & Die Co.

NORTH Bros. Mfg. Co., Philadelphia, Pa. "Yankee."

RELIABLE—See Conant & Donelson.

SAUNDERS' Sons, D., Yonkers, N. Y.

STANDARD Tool Co., Cleveland, O.

STARRETT Co., L. S., Athol, Mass.

UNION Caliper Co., Orange, Mass.

WELLS & Son Co., F. E., Greenfield, Mass. "Hercules."

WEST Haven Mfg. Co., New Haven, Conn. "Holdfast."

WINTER Bros. Co., Wrentham, Mass.

YANKEE—See North Bros. Mfg. Co.

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They will be able to identify you as anestablished factor in the Automobile Trade and you will receive recognition as such.

Moreover such manufacturers as advertise herein will be able to more fully understand your inquiry and prompt service will result.

The Automobile Trade Directory
243-249 W. 39th St., New York.

Complete Index to Classification appears on Pages 8 to 27.

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Tables and Data

PART V

Reference Tables, Data and Formulæ, including Reports on Tests of Materials, S. A. E. Standards, etc., also a Directory of National Trade Associations

A complete index to this section appears on pages 41 to 44

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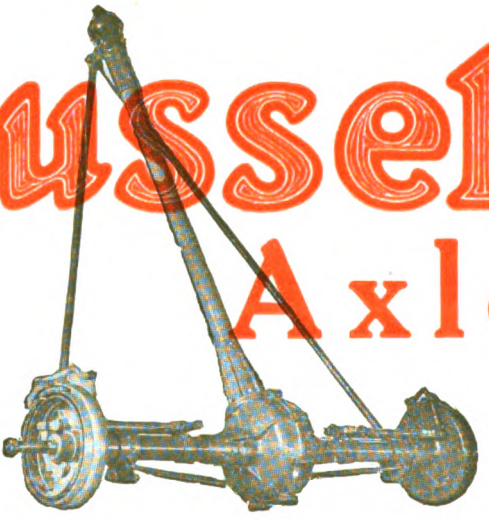
Russel Axles



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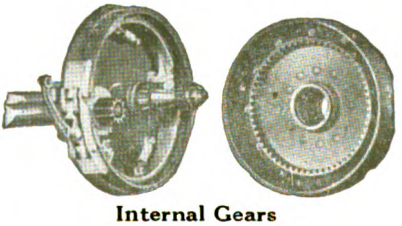

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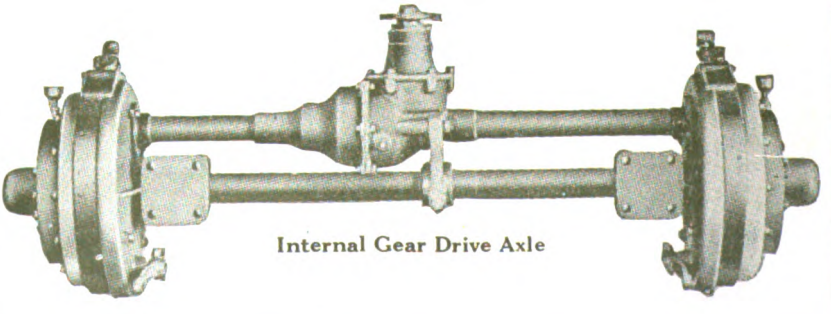

Internal Gear Drive Axle

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PART V

TABLES AND DATA

Arranged and Edited by J. Edward Schipper

HORSEPOWER FORMULAS

Four-Stroke Cycle Engines

Authority	Formula
N. A. C. C. (Formerly A. L. A. M.) Royal Auto. Club	$\frac{D^2N}{2.5} = H.P.$
Brit. Inst. of Auto. Engrs.	$0.45\ (D+L)\ (D-1.18) = H.P.$
E. P. Roberts	$\frac{D^2LRN}{18{,}000} = H.P.$

D = Diam. of cylinder in inches.
L = Length of stroke in inches.
R = Rev. per min. of crankshaft.
N = Number of cylinders.

Derivation of the N. A. C. C. (Formerly A. L. A. M.) Horsepower Formula

The indicated horsepower of a single-cylinder, four-cycle engine is equal to one-quarter time the mean effective pressure P, acting throughout the working stroke, times the area of the piston A, in square inches, times the piston speed S divided by 33,000, thus,

$$\text{I. H. P} = \tfrac{1}{4}\frac{PAS}{33{,}000}$$

Multiplying this by the number of cylinders N gives the I. H. P. for an engine of the given number of cylinders, and further multiplying by the mechanical efficiency of the engine E gives the brake horsepower. Therefore the complete equation for B. H. P. reads:

$$\text{B. H. P.} = \frac{PASNE}{33{,}000 \times 4}$$

The A. L. A. M. assumed that all motor car engines will deliver or should deliver their rated power at a piston speed of 1,000 feet per minute, that the mean effective pressure in such engine cylinders will average 90 pounds per square inch, and that the mechanical efficiency will average 75%.

Substituting these values in the above B. H. P. equation, and substituting for A its equivalent, $.7854\ D^2$, the equation reads:

$$\text{B. H. P.} = \frac{90 \times .7854\ D^2 \times 1{,}000 \times N \times .75}{33{,}000 \times 4}$$

and combining the numerical values it reduces to:

$$\text{B. H. P.} = \frac{D^2N}{2.489}$$

or, in round numbers, with a denominator 2.5.

Index to Tables and Data appears on Pages 41 to 44.

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HORSEPOWER TABLE BY N.A.C.C. (*Formerly A.L.A.M. Formula*)

In using table, find bore of cylinder in inches or millimeters in the proper left hand column, then read across to right under column for the number of cylinders that the motor under consideration has.

Bore = D		Number of Cylinders = N			
Inches	Millimeters	4	6	8	12
2½.....	64	10.00	15.00	20.00	30.00
2⅝.....	68	11.03	16.54	22.05	33.08
2¾.....	70	12.10	18.15	24.20	36.30
2⅞.....	73	13.23	19.84	26.45	39.68
3.....	76	14.40	21.60	28.80	43.20
3⅛.....	79	15.63	23.44	31.25	46.88
3¼.....	83	16.90	25.35	33.80	50.70
3⅜.....	85	18.23	27.34	36.45	54.68
3½.....	89	19.60	29.40	39.20	58.80
3⅝.....	92	21.03	31.54	42.05	63.08
3¾.....	95	22.50	33.75	45.00	67.50
3⅞.....	99	24.03	36.04	48.05	72.08
4.....	102	25.60	38.40	51.20	76.80
4⅛.....	105	27.23	40.84	54.45	81.68
4¼.....	108	28.90	43.35	57.80	86.70
4⅜.....	111	30.63	45.94	61.25	91.88
4½.....	114	32.40	48.60	64.80	97.20
4⅝.....	118	34.23	51.34	68.45	102.68
4¾.....	121	36.10	54.15	72.20	108.30
4⅞.....	124	38.03	57.04	76.05	114.08
5.....	127	40.00	60.00	80.00	120.00
5⅛.....	130	42.03	63.04	84.05	126.08
5¼.....	133	44.10	66.15	88.20	132.30
5⅜.....	137	46.23	69.34	92.45	138.68
5½.....	140	48.40	72.60	96.80	145.20
5⅝.....	143	50.63	75.94	101.25	151.88
5¾.....	146	52.90	79.35	105.80	158.70
5⅞.....	149	55.23	82.84	110.45	165.68
6.....	152	57.60	86.40	115.20	172.80

Index to Tables and Data appears on Pages 41 to 44.

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Manufacturers of

Front and Rear Axles

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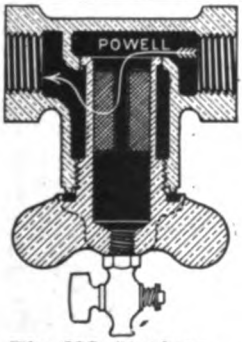

Fig. 696—Strainer

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Are Guaranteed For Service and Durability

We manufacture a complete line of gasoline generator valves, cocks, strainers, cylinder lubricators, oil and grease cups, priming cups, unions and brass fittings. Dealers! Think this over and write for "Powell" Automobile Catalogue, and Prices.

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PERCENTAGE OF SLIP OF MOTOR CAR DRIVING WHEELS
(Henry Souther)

From Mr. Henry Souther's analysis of the results of tests on tire slips at Brooklands, England, on a level racing track of the best sort, with plain round tread tires inflated as is usual for racing, the percentage of slip of the rear wheels when driving is given in the following table:

0.3	for a	speed	of	40	miles	per hour.
0.6	"	"	"	50	"	" "
1.1	"	"	"	60	"	" "
1.8	"	"	"	70	"	" "
3.7	"	"	"	80	"	" "
5.4	"	"	"	90	"	" "

The driving wheel on the inside, running around a curved track, slips a very little more than the outer wheel as the centrifugal force going around curves reduces the weight on the inner wheel permitting it to slip more readily than the outer wheel.

FORMULA FOR RATE OF SPEED (*Trego*)

To find the rate of speed of an automobile in miles per hour when the total distance covered and the total running time are known:

Given: Time in minutes and seconds and distance.

Using minutes.

Formula is: $\frac{D}{\frac{T}{60}} = MPH$

Divide the time in minutes and fractions thereof by 60. Then divide the distance by this quotient, disregarding decimal points, and the result will be the average speed in miles per hour for the distance.

Example: 105.5 miles in 113 minutes 30 seconds.

```
60)113.5
   ------
1.89)105.5(55.8 miles per hour.
     945
     ----
     1100
      945
     ----
     1550
     1512
     ----
```

Using seconds,

Formula is: $\frac{36}{T \text{ (Time in seconds)}} = MPH.$

Divide 36 by the time in seconds, the distance being 1 mile.

Example: 1 mile in 45 seconds—

```
45)36 (80 miles per hour.
   360
```

A FORMULA FOR MEASURING CAR PERFORMANCE

Roadability = A.

B = Bore of engine.
S = Stroke of engine.
N = Number of cylinders.
R = Final gear ratio.
D = Diameter of wheels.
W = Total weight *moved*.

$$\frac{B^2 \times S \times N \times R}{W \times D} = A.$$

Ability figure—good. .00105—for American conditions.
Ability figure—low. .00065—for European conditions.

Index to Tables and Data appears on Pages 41 to 44.

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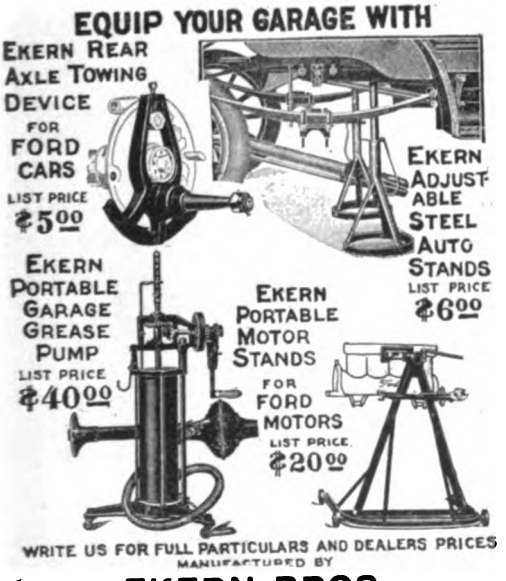

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WIND RESISTANCE

Dating back to the time of Smeaton various formulas have been used for determining the relation between wind pressure and velocity as affecting the stability of buildings and other exposed structures. Smeaton's table, which is largely used at the present day, is as follows:

Miles per Hour	Feet per Second	Pressure per sq. ft. in Pounds	Wind Called
1	1.47	0.005	Hardly perceptible.
2	2.93	0.020	Just perceptible.
3	4.4	0.044	
4	5.87	0.079	
5	7.33	0.123	Gentle pleasant wind.
6	8.8	0.177	
7	10.25	0.241	
8	11.75	0.315	
9	13.2	0.400	
10	14.67	0.492	
12	17.6	0.708	Pleasant brisk gale.
14	20.5	0.964	
15	22.00	1.107	
16	23.45	1.25	
18	26.4	1.55	
20	29.34	1.968	Very brisk.
25	36.67	3.075	
30	44.01	4.429	High wind.
35	51.34	6.027	
40	58.68	7.873	
45	66.01	9.963	Very high storm
50	73.35	12.30	
55	80.7	14.9	
60	88.02	17.71	
66	95.4	20.85	Great storm.
70	102.5	24.1	
75	110.	27.7	Hurricane.
80	117.36	31.49	
100	146.67	49.2	Immense hurricane.

The foregoing table is applicable to automobile work assuming that the machine is moving in still air at the varying rates of speed given in miles per hour. It is generally admitted that the Smeaton formula gives results too high. The formula is $P=0.005\ V^2$. Other and more recent formulas are those of Martin, $P=0.004\ V^2$, and Dines, $P=0.0029\ V^2$. At a rate of speed of 60 miles an hour these formulas give the following results in pounds per square foot: Smeaton, 18; Martin, 14.4; Dines, 10.44.

In the case of pleasure cars the wind resistance at ordinary rates of speed is so low that it does not greatly influence design while in the case of racing machines many ingenious forms of construction have been tried out with a view to the reduction of the loss from this source.

POWER REQUIRED TO OVERCOME WIND RESISTANCE (*Forrest Jones*)

A formula for use in approximating the power required to overcome wind resistance is given as follows:

$$HP=\frac{PA\ (M\ 5{,}280\ |\ 60)}{33{,}000}=0.96\ PAM$$

In which HP = Horsepower required to overcome wind resistance
P = Pressure of wind in pounds per square foot.
A = Front area of body in square feet.
M = Speed of car in miles per hour.

Numerical example:

Assuming a car with a front area of 10 square feet and a speed of 60 miles per hour, the power required to overcome this wind resistance will be:

$$HP=\frac{13\times 10\ (60\times 5{,}280\ |\ 60)}{33{,}000}=20.8$$

It is not believed that this formula will hold out for all ranges in speed, nor can it be said with certainty that the front area total will be correctly stated if the areas of all the parts without respect to shape or location are figured in on the same basis. In all probability, the most certain way to ascertain the amount of power required to overcome wind resistance is to take a certain car and with suitable instrument under road conditions measure the power required

Index to Tables and Data appears on Pages 41 to 44.

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POWER CONSUMED IN MOVING A PLANE SURFACE AT DIFFERENT VELOCITIES IN THE OPEN AIR (*Kempe*)

SPEED IN		Horse-power per Square Foot of Effective Surface	SPEED IN		Horse-power per Square Foot of Effective Surface
Miles per Hour	Feet per Minute		Miles per Hour	Feet per Minute	
10	880	0.013	50	4,400	1.64
15	1,320	0.044	75	6,600	5.54
20	1,760	0.105	100	8,800	13.13
25	2,200	0.205	150	13,200	44.29
30	2,640	0.354	200	17,600	105.00

STRIKING ENERGY OF AUTOMOBILES (*Durand*)

Let W = weight of automobile, measured in pounds.
F = average force over the distance required to bring automobile to rest, measured in pounds.
L = distance over which force is exerted to bring automobile to rest, measured in feet.
V = velocity in feet per second,

Then Energy $= \dfrac{W V^2}{64.4}$ in foot pounds,

$F L$ = measure of destructive work done in stopping the machine.

Then $$F L = \frac{W V^2}{64.4}$$

$$F = \frac{W V^2}{64.4 L}$$

$$L = \frac{W V^2}{64.4 F}$$

Or, otherwise and more generally, let E be any fraction or amount of energy which is lost in overcoming an average resistance F over a distance L.
Then:

$$E = F L$$
$$F = E \div L$$
$$L = E \div F$$

In the actual case of automobile collision, F, as has been carefully noted, is merely a distance average of the force developed. It means simply that there will be as much destructive work done as would correspond to the exhibition of a force F over a distance L. Actually, the destructive work will be made up of parts, each one of which may consist of a very much larger force, acting through such smaller distance as may be needed for the rupture of the part in question.

Index to Tables and Data appears on Pages 41 to 44.

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Hydrometer Syringes for Storage Batteries

HYDROMETERS FOR GASOLINE

TYPE B-4 Hydrometer Syringe. Standard grade for testing strength of storage batteries. Absolutely essential for the economical and efficient handling of storage batteries.
TYPE A-1 Hydrometer Syringe. same quality as above (medium size) in wood box.
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No. 102-A Gasoline Hydrometer with thermometer in glass jar and round wooden box. No. 104 Same without thermometer.

If at any time within five years of purchase a "Genco" Hydrometer Syringe develops any defect; or in any way falls down on the job [exclusive of breakage] we will give the purchaser a new one without one cent of additional cost.

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DIMENSIONS AND LIFT OF POPPET VALVES FOR A GIVEN SIZE OF OPENING

D = Smaller diameter of valve seat.
d = diameter of piping to which valve opening must correspond.

$$r = \frac{D}{d}$$

FLAT-SEATED VALVES.

For $r = 1$	Lift	$= d \times 0.250 = D \times 0.250.$
" $r = 1.25$	"	$= d \times 0.200 = D \times 0.160.$
" $r = 1.5$	"	$= d \times 0.166 = D \times 0.111.$
" $r = 2$	"	$= d \times 0.125 = D \times 0.162.$
" $r = 2.5$	"	$= d \times 0.100 = D \times 0.040.$

CONE-SEATED VALVES; 45° ANGLE OF CONE.

For $r = 1$	Lift	$= d \times 0.307 = D \times 0.307.$
" $r = 1.25$	"	$= d \times 0.256 = D \times 0.205.$
" $r = 1.5$	"	$= d \times 0.219 = D \times 0.146.$
" $r = 2$	"	$= d \times 0.170 = D \times 0.084.$
" $r = 2.5$	"	$= d \times 0.138 = D \times 0.055.$

It will be noted that cone-seated valves require a lift from one-fifth to one-quarter greater than the corresponding flat-seated valves.

The proportions of lift given in connection with flat-seated valves are geometrically correct. It should, however, be borne in mind that flat-seated valves generally introduce a certain amount of wire drawing of the incoming charge. A slight increase over the theoretically correct lifts should consequently be provided. A definite coefficient cannot be given as this will depend considerably upon the valve seat and valve chest design as well as upon the proportions of the fillet between valve stem and valve head. The matter is one of personal intuition by the designer; in the best French designs the extra allowance seldom exceeds 25 per cent. of the theoretical lift. It is well to so arrange the contour of the valve and valve chamber profiles that a minimum of lift be required, as this is favorable to silence in running and to flexibility.

FORMULA FOR PISTON VELOCITY

The ratio of connecting rod length to stroke influences the velocity of the piston and the ollowing will hold: Let,

l = eccentricity of crank (half the stroke);
L = length of connecting rod;
v = linear velocity of crank-pin;
θ = crank angle;
S = piston velocity in feet per minute;
v = ratio;

when,

$$r = \frac{I}{L}$$

and,

$$S = v\ (\sin\ \theta \times l/2a \sin 2\ \theta)$$

In the above expression for the piston velocity, all terms higher than 2θ are neglected because of their small value, which affects the result little, and only makes the formula cumbersome

Index to Tables and Data appears on Pages 41 to 44.

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WE HAVE

the facilities, the experience, the resources and an unflagging desire to produce radiators that are the superior of any manufactured.

We offer all these to the solution of your cooling problems.

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New Haven, Connecticut

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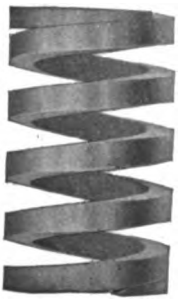
Vanadium and High Carbon Oil Tempered Springs

HIGH GRADE SPRINGS OUR SPECIALTY

N. Y. Wire & Spring Co.

F. A. WERNIG *Gen. Mgr.* 586-588 Washington St., N. Y.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Cheaper—

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HIDE, LEATHER & BELTING CO., 229 S. Meridian St., Indianapolis, Ind.

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WORK DONE BY CLUTCH AND BRAKES (*C. H. Taylor*)

Energy absorption of the clutch in accelerating a motor vehicle, assuming the ideal condition of uniform acceleration

$$W = \frac{MV\,(2Q - FV)}{2(F - Mg\theta)}$$

and

$$w = Q - \frac{FV}{2}$$

$$f = \frac{MV}{F - Mg\,\theta}$$

where W = total energy absorbed by clutch in accelerating the mass M from zero to V ft. per second when coupled with a motor developing Q foot-pounds per second; w = energy per second absorbed by clutch under the above conditions $= \frac{W}{f}$ where f = time required for acceleration in seconds. θ = tangent of the grade angle, or the per cent. of grade; F = accelerative force applied by the propelling system; g = gravity = 32.2. Also.

$$W = MV\left(\frac{Q}{F} - \frac{V}{2}\right)$$

here $\theta = o$ and

$$f = \frac{MV}{F}.$$

Energy required to be absorbed by the brakes when stopping a motor vehicle, on the level, from full speed is equal to

$$E = \frac{MV^2 + Mg\theta fV}{2}$$

$$f = \frac{MV}{F - Mg\theta}$$

using the same symbols as for the clutch formula, but applied to retardation instead of acceleration

Index to Tables and Data appears on Pages 41 to 44.

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Bimel
PORTLAND, IND.

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PORTLAND, IND.

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High Grade Radiators

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Chicago, Ill.

WIZARD BRONZE

If this small advertisement does no more than cause you to "ask for samples of our Wizard Manganese and Phosphorized Bronze" it will have accomplished its mission.

There's a surprise awaiting Automobile Makers and Specialty parts manufacturers who have never used WIZARD BRAND Manganese or Phosphorized Bronze.

Words are futile. Demonstration is the thing. Let the proof of WIZARD BRAND BRONZE quality be the reason for your switching from your present bronze to WIZARD. Its popularity is growing like wildfire. There's a reason. Either office will give you the reasons. Write us

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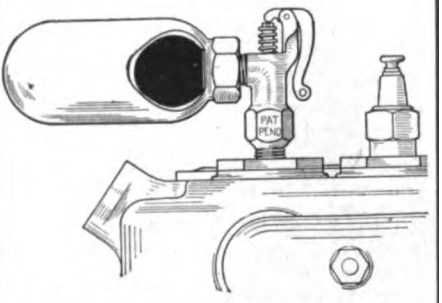
Front St.

THE BUELL EXPLOSION WHISTLE



Installed in place of a priming cup. Utilizes the full explosion pressure and is consequently the most powerful of all signals.

Becoming popular rapidly, owing to its being a perfect working warning device. Will operate indefinitely without attention.

An ideal signal for all cars, including trucks, where its indestructibility is especially appreciated. Can be transferred from car to car as the engines wear out.

Eventually the lowest cost signal.
SINGLE TONE, $4.25 CHIME, $6.00
Write for trade proposition and discount.

BUELL MANUFACTURING CO.
1806 S. Michigan Ave., Chicago, Ill.

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FORMULAS FOR CONE CLUTCHES (*C. A. Schaefer*)

H.P. = horse-power transmitted.

N = revolutions of crank-shaft per minute.

r = mean radius of friction cone, in inches.

r_1 = large radius of friction cone, in inches.

r_2 = small radius of friction cone, in inches.

R_1 = outside radius of leather band, in inches.

R_2 = inside radius of leather band, in inches.

v = velocity of a point at distance τ from the center, in feet per minute.

F = tangential force acting at radius τ, in pounds.

Pn = total normal pressure between cone surfaces, in pounds.

Ps = spring pressure, in pounds.

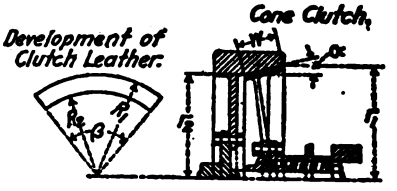
α = angle of clutch surface with axis of shaft = 7 to 13 degrees.

β = included angle of clutch leather, when developed, in degrees.

f = coefficient of friction = 0.20 to 0.25 for greasy leather on iron.

p = allowable pressure per square inch of leather band = 1 to 8 pounds.

W = width of clutch leather, in inches.



$$R_1 = \frac{r_1}{\sin \alpha} \qquad H.P. = \frac{Pn\ f\ r\ N}{63025}$$

$$R_2 = \frac{r_2}{\sin \alpha}$$

Engagement with some slip:

$$\beta = \sin \alpha \times 360 \qquad Pn = \frac{Ps}{\sin \alpha}$$

$$r = \frac{r_1 \times r_2}{2} \qquad Ps = \frac{H.P. \times 63025 \sin \alpha}{f\ r\ N}$$

$$v = \frac{2\pi r N}{12}$$

Engagement without slip:

$$F = \frac{H.P. \times 33000}{v} \qquad Pn = \frac{Ps}{\sin \alpha + f \cos \alpha}$$

$$W = \frac{Pn}{2\ \pi r\ p}$$

$$Ps = \frac{H.P. \times 63025\ (\sin \alpha + f \cos \alpha)}{f\ r\ N}$$

CO-EFFICIENTS OF FRICTION

The relative value of different materials of construction ascertained as the result of tests made by the National Brake & Clutch Company is tabulated as follows:

Materials	Co-efficient
Metal and cork, Leather and cork, Fibre and cork, on dry metal	0.35
Metal and cork, Leather and cork, Fibre and cork, on oily metal	0.32
Fibre on dry metal	0.27
Fibre on oily metal	0.10
Leather on dry metal	0.23
Leather on oily metal	0.15
Charred leather on oily metal	0.08
Metal on dry metal	0.15
Metal on oily metal	0.07

The co-efficient will vary with the condition of the contacting surfaces. Smooth and unyielding surfaces offer less resistance than rough and yielding ones. In metal to metal contacts different metals are usually employed for the opposing surfaces, as bronze and steel in plate clutches and cast iron and steel in brakes of the shoe type.

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Spinning, Sheet Metal Work, Coppersmithing a Specialty

General Machine Shop Work. Quick action on Metal Floats, Baffle Plates, Reflectors, Pipe Bending, Funnels, Tanks of all shapes and materials made to your specification.

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Cadillac	Ford	Kissell	Overland
Chalmers	Franklin	Maxwell	Paige
Chandler	Hudson	Mitchell	Reo
Chevrolet	Hupmobile	Oakland	Studebaker
			Willys-Knight

Guaranty Securities Corporation will finance for such dealers any number of sales made on this basis.

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We refer by permission to the following banks: Metropolitan Trust Co., New York. Liberty National Bank, New York. First National Bank, Chicago. Corn Exchange National Bank, Chicago. Continental and Commercial National Bank, Chicago.

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Guaranty Securities Corp., Equitable Bldg., N.Y.

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The new Hardman "Sure Grip" Tread illustrated herewith is another example of the progressiveness of the Hardman policy.

This new tread combines all the Hardman "Sure Grip" features and absolutely non-skid qualities with smoother riding, perfect vacuum in the suction cups at all times, carries more rubber and will wear down evenly at every point.

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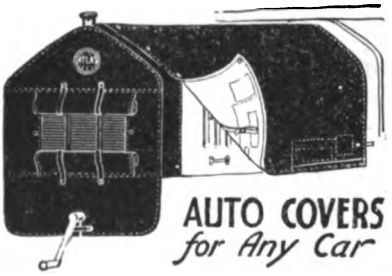
ATLAS



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ENERGY CONSUMPTION OF COMMERCIAL VEHICLES (*Churchward*)

The tractive effort of pneumatic tires on hard level asphalt varies from 15 pounds per ton for special tires designed for electric runabouts up to 35 pounds per ton for the standard type used on gasoline touring cars.

The tractive effort of pneumatic tires is also greatly affected by the air pressure increasing rapidly as the air pressure is reduced.

The tractive effort of solid tires on hard level asphalt varies from 18 pounds to 26 pounds per ton, depending upon:

(1) The diameter of driving wheels.
(2) Revolutions per minute.
(3) Load in pounds, per square inch or pounds per inch width.
(4) Composition of the compound used.
(5) Method of attaching tire to wheel rim.

The tractive effort of a vehicle will vary with the road surface as per table, taking the tractive effort of a vehicle on hard level alphalt as unity.

(1)	Level asphalt (hard)	1.00
(2)	Wood pavement	1.15
(3)	Level macadam	1.15 to 3
(4)	Plank road	.9
	Cobble stones	1.75
(5)	Good dirt road	1.10 to 2
(6)	Ordinary country road (dirt)	2.
(7)	Sand	20 .

The tractive effort due to grades must be added to the tractive effort for a given road surface. Example: 5 per cent. grade on hard level asphalt. Hard level asphalt 25 pounds per ton. 5 per cent. grade = 100 pounds per ton, due to grade alone. 100 + 25 = total tractive effort = 125 pounds per ton, total.

Taking everything into consideration, that is to say, life of engine, transmission, tires and maintenance of vehicle as a whole, experience shows that the following table of economic speeds is approximately correct:

Gross Weight	Type of Tires	Speed in M.P.H.
1,500 lbs.	Pneumatic	20
2,000 "	"	20
3,000 "	"	18
4,000 "	"	16
2,000 "	Solid	16
3,000 "	"	15
4,000 "	"	13
5,000 "	"	11
7,000 "	"	9
10,000 "	"	8
15,000 "	"	7
20,000 "	"	6

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DRAWN METAL LARG-HEX GREASE CUPS

Grease Cups

Plain and Ratchet Locking

Spring Bolt Caps, Hub Caps, Light and Heavy Automobile Stampings

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60— Leading Car Builders Equip With AC Spark Plugs

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They know A C Spark Plugs are dependable.

Champion Ignition Co., Flint, Mich.

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REVOLUTIONS PER MINUTE OF AUTO ROAD WHEELS AT DIFFERENT RATES OF SPEED

Miles per Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	35	40
Feet per Minute	88	176	264	352	440	528	616	704	792	880	968	1,056	1,144	1,232	1,320	1,418	1,496	1,584	1,672	1,760	1,936	2,112	2,288	2,464	2,640	3,080	3,520
WHEEL DIAMETERS 12	28	56	84	112	140	168	196	224	252	280	308	336	364	392	420	448	476	504	532	560	616	672	728	784	840	980	1,120
14	24	48	72	96	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	528	576	624	672	720	840	960
16	21	42	63	84	105	126	147	168	189	210	231	252	273	294	315	336	357	378	399	420	462	504	546	588	630	735	840
18	18 6	37 33	56	72.66	93 33	112	130.66	145.33	168	186.66	203.33	224	2a2.66	161.33	280	298.66	317.33	336	354.66	373.33	410.66	448	485.33	522.66	560	653.33	746.66
20	16 8	32 6	50.4	67.2	84	100.8	117.6	134.4	151.2	168	184.8	201.6	218.4	235.2	252	268.8	285.6	302.4	319.2	336	369.6	403.2	436.8	470.4	504	588	672
22	15 27	30 54	45.81	61.09	76 36	91.63	106.90	122.18	137.45	152.72	168	183.27	198.54	213.81	229.09	244.36	259.63	274.90	290.18	305.45	336	366.54	397.09	427.63	458.18	534.54	611.09
24	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280	308	336	364	392	420	490	560
26	12 92	21 84	38 76	51.69	63 61	77.53	90.46	103.38	116.30	129.23	142.15	155.07	168	180.92	193.84	206.76	219.69	232.61	245.53	258.46	284.30	310.15	336	361.84	397.69	452.30	516.92
28	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	264	288	312	336	360	420	480
30	11 2	22 4	33.6	44 8	56	67.2	78.4	89.6	100.8	112	123.2	134.4	145.6	156.8	168	179.2	190.4	201.6	212.8	224	246.4	268.8	291.2	313.6	336	392	448
32	10 5	21	31 5	42	52.5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210	231	252	273	294	315	367.5	420
34	9.88	19 70	29.64	39.52	49.41	59.29	69.17	79.05	88.94	98.82	108.70	118.58	128.47	138.35	148.23	158.11	168	177.88	187.76	197.64	217.41	237	256.94	276.70	296.47	345.88	395.29
36	9.33	18 66	28	37.33	46.66	56	65.33	74.66	84	93.33	102.66	112	121.33	130.66	140	149.33	158.66	168	177.33	186.66	205.33	224	242.66	261.33	280	326.66	373.33
38	8.8	17.68	26.52	35.36	44.21	53.05	61.89	70.73	79.57	88.42	97.27	106.10	114.94	123.78	132.63	141.47	150.31	159.15	168	176.84	194.52	212.21	238.89	247.57	265.26	309.21	353.42
40	8.4	16.8	25.2	33.6	42	50.4	58.8	67.2	75.6	84	92.4	100.8	109.2	117.6	126	134.4	142.8	151.2	159.6	168	184.8	201.6	218.4	235.2	252	294	336
42	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	176	192	208	224	240	280	320
44	7.63	15.27	22.10	30.54	38.18	45.81	53.45	61.09	68.72	76.36	84	91.63	99.24	106.10	114.54	122.18	129.81	137.45	145.09	156.72	168	183.27	198.54	213.81	229.09	267.27	305.45

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8 miles per hour more speed
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RATE OF SPEED IN MILES PER HOUR FOR ELAPSED TIME OVER THE MEASURED MILE FROM ONE TO THREE MINUTES

Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour
Min.	*Sec.*		*Min.*	*Sec.*		*Min.*	*Sec.*	
1	0	60.00	1	27	41.38	1	54	31.58
1	1	59.00	1	28	40.91	1	55	31.30
1	2	58.06	1	29	40.45	1	56	31.03
1	3	57.14	1	30	40.00	1	57	30 77
1	4	56.25	1	31	39.56	1	58	30.50
1	5	55.38	1	32	39.13	1	59	30.25
1	6	54.54	1	33	38.71	2	0	30.00
1	7	53.73	1	34	38.29	2	3	29.26
1	8	52.94	1	35	37.89	2	6	28.57
1	9	52.17	1	36	37.50	2	9	27.90
1	10	51.42	1	37	37.11	2	12	27.27
1	11	50.70	1	38	36.73	2	15	26 66
1	12	50.00	1	39	36.36	2	18	26.08
1	13	49.31	1	40	36.00	2	21	25.53
1	14	48.65	1	41	35.64	2	24	25.00
1	15	48.00	1	42	35.29	2	27	24.49
1	16	47.37	1	43	34.95	2	30	24.00
1	17	46.75	1	44	34.61	2	33	23.53
1	18	46.15	1	45	34.28	2	36	23.07
1	19	45.57	1	46	33.96	2	39	22.64
1	20	45.00	1	47	33.64	2	42	22.22
1	21	44.44	1	48	33.33	2	45	21.81
1	22	43.90	1	49	33.03	2	48	21.42
1	23	43.37	1	50	32.72	2	51	21.05
1	24	42.85	1	51	32.43	2	54	20.69
1	25	42.35	1	52	32.14	3	0	20.00
1	26	41.86	1	53	31.86	..	..	.....

SPEED FORMULA

To reduce A miles in B seconds to miles per hour.

$$A \times \frac{3600}{B} = \text{miles per hour.}$$

SPEED EQUIVALENTS IN AMERICAN AND FRENCH MEASUREMENTS

3 mile per hour	= 88	ft. per minute.
	= 1.46	ft. per second.
	= 27.8	metres per minute.
	= 0.463	metre per second.
3 km. per hour	= 0.624	miles per hour.
	= 54.9	ft. per minute.
	= 0.914	metre per second.

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REFERENCE TABLE SHOWING EQUIVALENT SPEED IN MILES AND KILOMETERS PER HOUR FOR ELAPSED TIME OVER THE MEASURED MILE OR MEASURED KILOMETER FROM 24 SECONDS PROGRESSIVELY BY 1-5 SECOND TO 59 4-5 SECONDS

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres. per hour.	Time of one Kilometre m. s.	Equal to Kilometres. per hour.	Equal to miles per hour.	Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre m. s.	Equal to Kilometres per hour.	Equal to miles per hour.
24	150.00	241.54	24	150.00	93.15	35	102.85	165.62	35	102.85	63.87
1/5	148.76	239.55	1/5	148.76	92.38	1/5	102.27	164.68	1/5	102.27	63.51
2/5	147.54	237.58	2/5	147.54	91.62	2/5	101.69	163.75	2/5	101.69	63.15
3/5	146.34	235.65	3/5	146.34	90.87	3/5	101.12	162.83	3/5	101.12	62.79
4/5	145.16	233.75	4/5	145.16	90.14	4/5	100.56	161.93	4/5	100.56	62.44
25	144.00	231.88	25	144.00	89.42	36	100.00	161.03	36	100.00	62.10
1/5	142.86	230.05	1/5	142.86	88.71	1/5	99.44	160.13	1/5	99.44	61.75
2/5	141.73	228.23	2/5	141.73	88.01	2/5	98.90	159.26	2/5	98.90	61.41
3/5	140.62	226.44	3/5	140.62	87.32	3/5	98.36	158.39	3/5	98.36	61.08
4/5	139.53	224.67	4/5	139.53	86.64	4/5	97.82	157.52	4/5	97.82	60.74
26	138.46	222.96	26	138.46	85.98	37	97.29	156.67	37	97.29	60.41
1/5	137.40	221.25	1/5	137.40	85.32	1/5	96.77	155.83	1/5	96.77	60.09
2/5	136.36	219.58	2/5	136.36	84.68	2/5	96.25	155.00	2/5	96.25	59.77
3/5	135.34	217.94	3/5	135.34	84.04	3/5	95.74	154.17	3/5	95.74	59.45
4/5	134.33	216.31	4/5	134.33	83.42	4/5	95.23	153.34	4/5	95.23	59.13
27	133.33	214.70	27	133.33	82.80	38	94.73	152.55	38	94.73	58.82
1/5	132.25	213.12	1/5	132.35	82.19	1/5	94.24	151.75	1/5	94.24	58.52
2/5	131.38	211.56	2/5	131.38	81.58	2/5	93.75	150.96	2/5	93.75	58.22
3/5	130.43	210.03	3/5	130.43	80.10	3/5	93.26	150.17	3/5	93.26	57.91
4/5	129.50	208.53	4/5	129.50	80.42	4/5	92.78	149.40	4/5	92.78	57.61
28	128.57	207.03	28	128.57	79.84	39	92.30	148.64	39	92.30	57.32
1/5	127.66	205.57	1/5	127.66	79.27	1/5	91.83	147.87	1/5	91.83	57.02
2/5	126.76	204.12	2/5	126.76	78.71	2/5	91.37	147.13	2/5	91.37	56.74
3/5	125.87	202.69	3/5	125.87	78.16	3/5	90.91	146.39	3/5	90.91	56.45
4/5	125.00	201.29	4/5	125.00	77.62	4/5	90.45	145.65	4/5	90.45	56.17
29	124.13	199.88	29	124.13	77.08	40	90.00	144.92	40	90.00	55.89
1/5	123.28	198.52	1/5	123.28	76.55	1/5	89.55	144.20	1/5	89.55	55.61
2/5	122.45	197.18	2/5	122.45	76.04	2/5	89.11	143.49	2/5	89.11	55.33
3/5	121.62	195.84	3/5	121.62	75.52	3/5	88.67	142.78	3/5	88.67	55.06
4/5	120.80	194.52	4/5	120.80	75.01	4/5	88.23	142.07	4/5	88.23	54.79
30	120.00	193.23	30	120.00	74.52	41	87.80	141.39	41	87.80	54.52
1/5	119.20	191.95	1/5	119.20	74.02	1/5	87.38	140.70	1/5	87.38	54.26
2/5	118.42	190.69	2/5	118.42	73.54	2/5	86.95	140.01	2/5	86.95	53.99
3/5	117.64	189.43	3/5	117.64	73.05	3/5	86.53	139.34	3/5	86.53	53.73
4/5	116.88	188.21	4/5	116.88	72.58	4/5	86.12	138.68	4/5	86.12	53.48
31	116.13	187.00	31	116.13	72.11	42	85.71	138.02	42	85.71	53.22
1/5	115.38	185.79	1/5	115.38	71.65	1/5	85.30	137.35	1/5	85.30	52.97
2/5	114.65	184.62	2/5	114.65	71.20	2/5	84.90	136.71	2/5	84.90	52.72
3/5	113.90	183.41	3/5	113.90	70.73	3/5	84.50	136.07	3/5	84.50	52.47
4/5	113.21	182.28	4/5	113.21	70.30	4/5	84.11	135.44	4/5	84.11	52.23
32	112.50	181.16	32	112.50	69.86	43	83.72	134.81	43	83.72	51.99
1/5	111.80	180.03	1/5	111.80	69.43	1/5	83.33	134.18	1/5	83.33	51.75
2/5	111.11	178.92	2/5	111.11	69.00	2/5	82.95	133.57	2/5	82.95	51.51
3/5	110.43	177.82	3/5	110.43	68.57	3/5	82.57	132.96	3/5	82.57	51.27
4/5	109.75	176.73	4/5	109.75	68.15	4/5	82.19	132.35	4/5	82.19	51.04
33	109.09	175.67	33	109.09	67.74	44	81.81	131.75	44	81.81	50.80
1/5	108.43	174.60	1/5	108.43	67.33	1/5	81.44	131.14	1/5	81.44	50.57
2/5	107.78	173.56	2/5	107.78	66.93	2/5	81.08	130.56	2/5	81.08	50.35
3/5	107.14	172.53	3/5	107.14	66.53	3/5	80.71	129.96	3/5	80.71	50.12
4/5	106.51	171.51	4/5	106.51	66.14	4/5	80.35	129.38	4/5	80.35	49.89
34	105.88	170.50	34	105.88	65.75	45	80.00	128.82	45	80.00	49.68
1/5	105.26	169.50	1/5	105.26	65.36	1/5	79.64	128.24	1/5	79.64	49.45
2/5	104.65	168.52	2/5	104.65	64.98	2/5	79.29	127.68	2/5	79.29	49.24
3/5	104.04	167.53	3/5	104.04	64.61	3/5	78.94	127.11	3/5	78.94	49.02
4/5	103.45	166.58	4/5	103.45	64.24	4/5	78.60	126.57	4/5	78.60	48.81

(Continued on page 806)

Index to Tables and Data appears on Pages 41 to 44.

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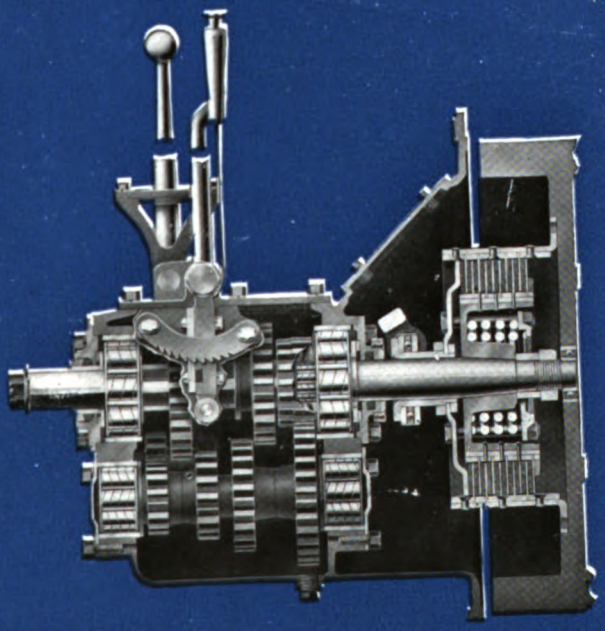
"The Proven Transmission"



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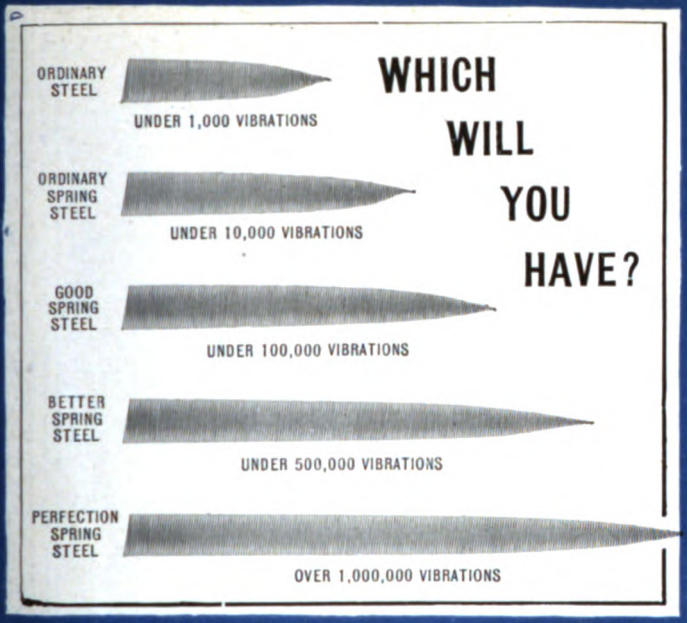

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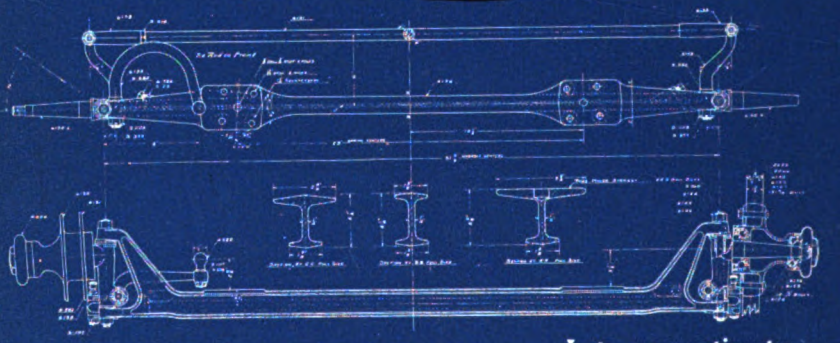

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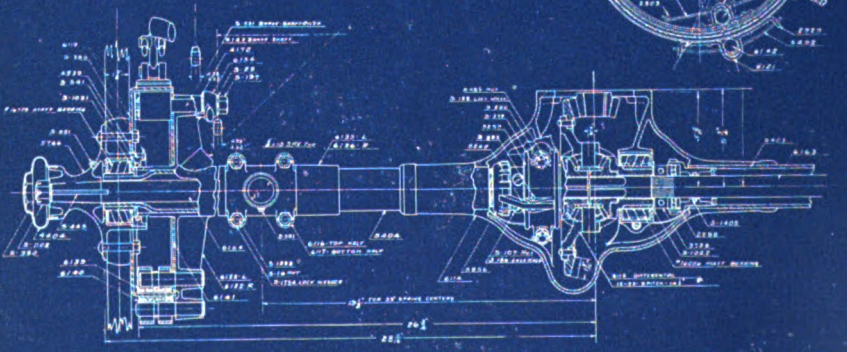

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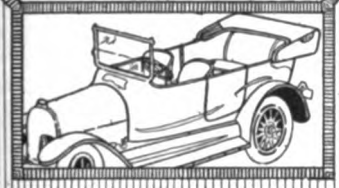

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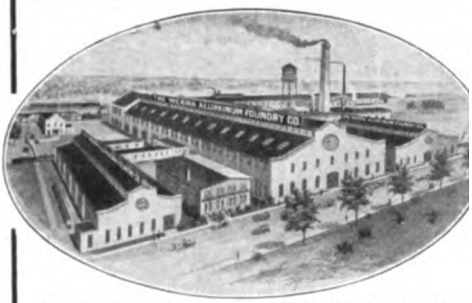

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Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres. per hour.	Time of one Kilometre m. s.	Equal to Kilometres. per hour.	Equal to miles per hour.	Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilo metres per hour.	Time of one Kilometre m. s.	Equal to Kilometres per hour.	Equal to miles per hour.
46	78.26	126.02	46	78.26	48.60	53	67.92	109.38	53	67.92	42.18
⅕	77.92	125.47	⅕	77.92	48.39	⅕	67.66	108.95	⅕	67.66	42.01
⅖	77.58	124.92	⅖	77.58	48.17	⅖	67.41	108.55	⅖	67.41	41.86
⅗	77.25	124.39	⅗	77.25	47.97	⅗	67.16	108.14	⅗	67.16	41.70
⅘	76.92	123.86	⅘	76.92	47.76	⅘	66.91	107.74	⅘	66.91	41.55
47	76.59	123.34	47	76.59	47.56	54	66.66	107.34	54	66.66	41.39
⅕	76.27	122.81	⅕	76.27	47.36	⅕	66.42	106.95	⅕	66.42	41.24
⅖	75.95	122.30	⅖	75.95	47.16	⅖	66.17	106.55	⅖	66.17	41.09
⅗	75.63	121.78	⅗	75.63	46.96	⅗	65.93	106.16	⅗	65.93	40.94
⅘	75.31	121.27	⅘	75.31	46.76	⅘	65.69	105.78	⅘	65.69	40.79
48	75.00	120.77	48	75.00	46.57	55	65.45	105.40	55	65.45	40.64
⅕	74.68	120.25	⅕	74.68	46.37	⅕	65.21	105.00	⅕	65.21	40.49
⅖	74.38	119.77	⅖	74.38	46.19	⅖	64.98	104.63	⅖	64.98	40.35
⅗	74.07	119.27	⅗	74.07	46.00	⅗	64.74	104.25	⅗	64.74	40.20
⅘	73.77	118.79	⅘	73.77	45.81	⅘	64.51	103.88	⅘	64.51	40.06
49	73.47	118.30	49	73.47	45.62	56	64.28	103.52	56	64.28	39.92
⅕	73.17	117.82	⅕	73.17	45.44	⅕	64.05	103.14	⅕	64.05	39.77
⅖	72.87	117.34	⅖	72.87	45.25	⅖	63.83	102.78	⅖	63.83	39.64
⅗	72.58	116.87	⅗	72.58	45.07	⅗	63.60	102.41	⅗	63.60	39.49
⅘	72.29	116.40	⅘	72.29	44.89	⅘	63.38	102.06	⅘	63.38	39.36
50	72.00	115.94	50	72.00	44.71	57	63.16	101.70	57	63.16	39.22
⅕	71.71	115.47	⅕	71.71	44.53	⅕	62.93	101.33	⅕	62.93	39.08
⅖	71.42	115.00	⅖	71.42	44.35	⅖	62.71	100.98	⅖	62.71	38.94
⅗	71.14	114.55	⅗	71.14	44.18	⅗	62.50	100.64	⅗	62.50	38.81
⅘	70.86	114.10	⅘	70.86	44.00	⅘	62.28	100.29	⅘	62.28	38.67
51	70.58	113.67	51	70.58	43.83	58	62.07	99.95	58	62.07	38.54
⅕	70.31	113.22	⅕	70.3	43.66	⅕	61.85	99.59	⅕	61.85	38.41
⅖	70.04	112.78	⅖	70.04	43.49	⅖	61.64	99.25	⅖	61.64	38.28
⅗	69.76	112.33	⅗	69.76	43.32	⅗	61.43	98.92	⅗	61.43	38.15
⅘	69.49	111.90	⅘	69.49	43.15	⅘	61.22	98.58	⅘	61.22	38.01
52	69.23	111.48	52	69.23	42.99	59	61.01	98.24	59	61.01	37.88
⅕	68.96	111.04	⅕	68.96	42.82	⅕	60.81	97.92	⅕	60.81	37.76
⅖	68.70	110.62	⅖	68.70	42.66	⅖	60.60	97.58	⅖	60.60	37.63
⅗	68.44	110.21	⅗	68.44	42.50	⅗	60.40	97.26	⅗	60.40	37.51
⅘	68.18	109.79	⅘	68.18	42.34	⅘	60.20	96.94	⅘	60.20	37.38

REFERENCE TABLE SHOWING EQUIVALENT SPEED IN MILES AND KILOMETERS PER HOUR FOR ELAPSED TIME OVER THE MEASURED MILE OR MEASURED KILOMETER FROM 1 MINUTE TO 30 MINUTES

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres. per hour.	Time of one Kilometre m. s.	Equal to Kilometres. per hour.	Equal to miles per hour.	Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre m. s.	Equal to Kilometres per hour.	Equal to miles per hour.
1 0	60.00	96.61	1 0	60.00	37.26	1 17	46.75	75.28	1 17	46.75	29.03
1 1	59.00	95.00	1 1	59.00	36.64	1 18	46.15	74.31	1 18	46.15	28.66
1 2	58.06	93.49	1 2	58.06	36.05	1 19	45.57	73.38	1 19	45.57	28.30
1 3	57.14	92.01	1 3	57.14	35.48	1 20	45.00	72.46	1 20	45.00	27.94
1 4	56.25	90.58	1 4	56.25	34.93	1 21	44.44	71.56	1 21	44.44	27.60
1 5	55.38	89.17	1 5	55.38	34.39	1 22	43.90	70.69	1 22	43.90	27.26
1 6	54.54	87.82	1 6	54.54	33.87	1 23	43.37	69.84	1 23	43.37	26.93
1 7	53.73	86.52	1 7	53.73	33.36	1 24	42.85	69.00	1 24	42.85	26.61
1 8	52.94	85.25	1 8	52.94	32.87	1 25	42.35	68.19	1 25	42.35	26.30
1 9	52.17	84.01	1 9	52.17	32.40	1 26	41.86	67.40	1 26	41.86	26.00
1 10	51.42	82.80	1 10	51.42	31.93	1 27	41.38	66.63	1 27	41.38	25.7
1 11	50.70	81.64	1 11	50.70	31.48	1 28	40.91	65.87	1 28	40.91	25.40
1 12	50.00	80.51	1 12	50.00	31.05	1 29	40.45	65.13	1 29	40.45	25.10
1 13	49.31	79.40	1 13	49.31	30.62	1 30	40.00	64.41	1 30	40.00	24.84
1 14	48.65	78.34	1 14	48.65	30.21	1 31	39.56	63.70	1 31	39.56	24.56
1 15	48.00	77.29	1 15	48.00	29.81	1 32	39.13	63.01	1 32	39.13	24.30
1 16	47.37	76.28	1 16	47.37	29.41	1 33	38.71	62.33	1 83	38.71	24.04

(*Continued on page* 808)

Index to Tables and Data appears on Pages 41 to 44.

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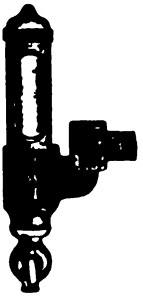

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Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres. per hour.	Time of 1 Kilometre m. s.	Equal to Kilometres. per hour.	Equal to miles per hour.	Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour	Time of 1 Kilometre m. s.	Equal to Kilometres per hour.	Equal to miles per hour.
1 34	38.29	61.66	1 34	38.29	23.77	3 6	19.35	31.16	3 6	19.35	12.01
1 35	37.89	61.01	1 35	37.89	23.53	3 12	18.75	30.19	3 12	18.75	11.64
1 36	37.50	60.38	1 36	37.50	23.29	3 18	18.18	29.27	3 18	18.18	11.29
1 37	37.11	59.76	1 37	37.11	23.04	3 24	17.64	28.40	3 24	17.64	10.95
1 38	36.73	59.14	1 38	36.73	22.81	3 30	17.14	27.60	3 30	17.14	10.64
1 39	36.36	58.55	1 39	36.36	22.58	3 36	16.66	26.82	3 36	16.66	10.34
1 40	36.00	57.97	1 40	36.00	22.35	3 42	16.21	26.10	3 42	16.21	10.06
1 41	35.64	57.39	1 41	35.64	22.13	3 48	15.79	25.42	3 48	15.79	9.80
1 42	35.29	56.82	1 42	35.29	21.91	3 54	15.38	24.76	3 54	15.38	9.55
1 43	34.95	56.28	1 43	34.95	21.70	4 0	15.00	24.15	4 0	15.00	9.31
1 44	34.61	55.73	1 44	34.61	21.50	4 6	14.63	23.56	4 6	14.63	9.08
1 45	34.28	55.20	1 45	34.28	21.28	4 12	14.28	22.99	4 12	14.28	8.86
1 46	33.96	54.68	1 46	33.96	21.09	4 18	13.95	22.46	4 18	13.95	8.66
1 47	33.64	54.17	1 47	33.64	20.89	4 24	13.63	21.95	4 24	13.63	8.46
1 48	33.33	53.67	1 48	33.33	20.70	4 30	13.33	21.46	4 30	13.33	8.28
1 49	33.03	53.19	1 49	33.03	20.51	4 36	13.04	21.00	4 36	13.04	8.10
1 50	32.72	52.69	1 50	32.72	20.32	4 42	12.76	20.54	4 42	12.76	7.92
1 51	32.43	52.22	1 51	32.43	20.14	4 48	12.50	20.13	4 48	12.50	7.76
1 52	32.14	51.75	1 52	32.14	19.96	4 54	12.24	19.71	4 54	12.24	7.60
1 53	31.86	51.30	1 53	31.86	19.78	5 0	12.00	19.32	5 0	12.00	7.45
1 54	31.58	50.85	1 54	31.58	19.61	5.12	11.54	18.58	5 12	11.54	7.16
1 55	31.30	50.40	1 55	31.30	19.43	5 24	11.11	17.89	5 24	11.11	6.90
1 56	31.03	49.96	1 56	31.03	19.27	5 36	10.71	17.24	5 36	10.71	6.65
1 57	30.77	49.55	1 57	30.77	19.11	5 48	10.34	16.65	5 48	10.34	6.42
1 58	30.50	49.11	1 58	30.50	18.94	6 0	10.00	16.10	6 0	10.00	6.21
1 59	30.25	48.71	1 59	30.25	18.78	6 15	9.60	15.46	6 15	9.60	5.96
2 0	30.00	48.30	2 0	30.00	18.63	6 30	9.23	14.86	6 30	9.23	5.73
2 3	29.26	47.11	2 3	29.26	18.17	6 45	8.88	14.30	6 45	8.88	5.51
2 6	28.57	46.00	2 6	28.57	17.74	7 0	8.57	13.80	7 0	8.57	5.32
2 9	27.90	44.92	2 9	27.90	17.32	7 15	8.27	13.31	7 15	8.27	5.13
2 12	27.27	43.91	2 12	27.27	16.93	7 30	8.00	12.88	7 30	8.00	4.97
2 15	26.66	42.93	2 15	26.66	16.55	7 45	7.74	12.46	7 45	7.74	4.80
2 18	26.08	42.00	2 18	26.08	16.20	8 0	7.50	12.08	8 0	7.50	4.66
2 21	25.53	41.11	2 21	25.53	15.85	8 30	7.06	11.37	8 30	7.06	4.38
2 24	25.00	40.25	2 24	25.00	15.52	9 0	6.66	10.72	9 0	6.66	4.13
2 27	24.49	39.43	2 27	24.49	15.21	9 30	6.31	10.16	9 30	6.31	3.92
2 30	24.00	38.64	2 30	24.00	14.90	10 0	6.00	9.66	10 0	6.00	3.72
2 33	23.53	37.89	2 33	23.53	14.61	10 30	5.71	9.19	10 30	5.71	3.54
2 36	23.07	37.15	2 36	23.07	14.32	11 0	5.45	8.77	11 0	5.45	3.38
2 39	22.64	36.45	2 39	22.64	14.06	11 30	5.21	8.39	11 30	5.21	3.23
2 42	22.22	35.78	2 42	22.22	13.80	12 0	5.00	8.05	12 0	5.00	3.10
2 45	21.81	35.12	2 45	21.81	13.54	13 0	4.61	7.42	13 0	4.61	2.86
2 48	21.42	34.49	2 48	21.42	13.31	14 0	4.28	6.89	14 0	4.28	2.66
2 51	21.05	33.89	2 51	21.05	13.07	15 0	4.00	6.44	15 0	4.00	2.48
2 54	20.69	33.31	2 54	20.69	12.85	20 0	3.00	4.83	20 0	3.00	1.86
2 57	20.34	32.75	2 57	20.34	12.63	30 0	2.00	3.22	30 0	2.00	1.24
3 0	20.00	32.20	3 0	20.00	12.42						

SPEED IN MILES PER HOUR WITH DIFFERENT GEAR RATIOS AND ROAD WHEEL SIZES AT 1000 R. P. M. OF ENGINE (WITH 3 PER CENT. LOSS ALLOWANCE)

Gears	4:1	3½:1	3:1	2½:1	2:1	1:1
30-in. Wheel....	21.64	24.73	28.86	34.63	43.29	86.57
32 " "	23.09	26.38	30.78	36.94	46.17	92.34
33 " "	23.81	27.21	31.74	38.09	47.62	95.23
34 " "	24.53	28.03	32.70	39.25	49.06	98.12
36 " "	25.98	29.68	34.63	41.55	51.94	103.89
38 " "	27.41	31.33	36.55	43.86	54.83	109.66
40 " "	28.85	32.97	38.37	46.16	57.71	115.41

Index to Tables and Data appears on Pages 41 to 44.

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Automobile Accessories
Shop Equipment
Tools and Hardware

Manufacturers of

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HILL-CLIMBING FORMULAS (*Worby Beaumont*)

W = Weight of car and load in pounds.
w = Weight of car and load in tons.
H = Total ascent in feet.
L = Length of hill in feet.
R = Road resistance in pounds per ton weight of car and load.
r = Air resistance in pounds = $V^2 A\ 0.0017$.
V = Velocity of car in feet per second.
A = Area of car in square feet presented to air resistance.
T = Time occupied in ascent in seconds.
E = Efficiency of transmission of power from engine to road wheels.
$HP.$ = Effective horse power of engine.
p = Power given off at road wheels or work done in ascending hill.
S = Speed of ascent in miles per hour.

Then if
P = Mean effective cylinder pressure.
L = Length of stroke in feet.
A = Area of piston in square inches.
N = Number of useful or firing strokes per minute,

the brake horse-power of petrol or steam engines, having a mechanical efficiency of E, is

$$\frac{EPLAN}{33000}$$

For compound steam engines the number of useful working strokes are those occurring in the low-pressure cylinder, and the mean effective pressure in the high-pressure cylinder or cylinders is referred to the area of the low-pressure cylinder.

The power given off at the road wheels during the ascent of the hill is

$$p = \frac{HW + (Rw + r)L}{T\ 550}$$

and the brake horsepower required at the engine with a selected value or E is

$$HP = \frac{HW + (Rw + r)L}{TE\ 550}$$

With the other conditions known, the efficiency may be found from

$$E = \frac{HW + (Rw + r)L}{HP.\ T\ 550}$$

the speed of the ascent in miles per hour from

$$S = \frac{L}{\dfrac{HWL + (Rw + r)}{HP.\ E\ 550}} L \times 1.466$$

and the time occupied in the ascent from

$$T = \frac{HW + (Rw + r)L}{HP.\ E\ 550}$$

Unless the probable speed of the car is high, or the wind velocity such that the pressure upon the surface of the car presented to air resistance opposing motion approaches that due to the speed of the car through still air, then the quantity r may be omitted from the foregoing expressions without introducing more than slight error.

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Brake Lining
Cone Clutch Facings
Asbestos Disc Facings
Tire Straps
Woven Strapping for Auto Tops
Anti Squeak Webbing

Rusco Specialties for Ford Cars

Transmission Lining
Cam Brakes
Endless Fan Belts

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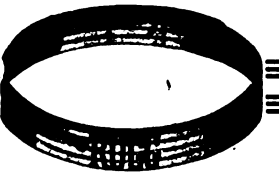
Middletown, Conn.

Rugg Chrome Leather Goods
"The Wear is There"

Fan Belts for Fords—
No. 1, Doubled and stitched, made of one piece of leather, one inch wide.
No. 2, Doubled and stitched of chrome and web, one inch wide.
No. IX, Latigo Belt, single-ply, stitched on edges, cemented and riveted.
Packed one dozen in a box.



Tire Blow-Out Patches

No.	Size Tire	Size of Patch
30.....	3	7 x 7
35.....	3½	7 x 8
40.....	4	7 x 8½
45.....	4½	7 x 9
50.....	5	8 x 10
55.....	5½	8 x 12
60.....	6	10 x 12

Packed—Small size 1 doz. in box; ½ doz. in box.
The list prices and the trade discount are right. Send for them.

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We Offer to One Good Dealer

in each locality, a Distributing Proposition that assures full control of Sales and Prices in his own territory, on a hand-made tire that is everywhere giving **phenomenal service.**
Our Plan includes advertising **your own** establishment as well as "Stronghold" tires; and effective support in building up and **holding** the class of trade that is most worth having.
Start now to build up a permanent and profitable tire business **of your own;** write for the "Stronghold" proposition.

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6-Gal. Cans to a Case.

REXINE AUTO SOAP
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By far the best soap on the market. It dissolves easily in cold water and will dissolve and remove dirt and grease instantly—it saves time, labor and cost of repainting. It is free from acid, can be used on body, metal work and upholstery without injury. Will not crack or chap the hands.

The only Auto Soap not advanced in price
1—case 24—1 qt. cans
1—case 6—1 gal. cans
5—gallon pails
½ bbl.—and barrels.

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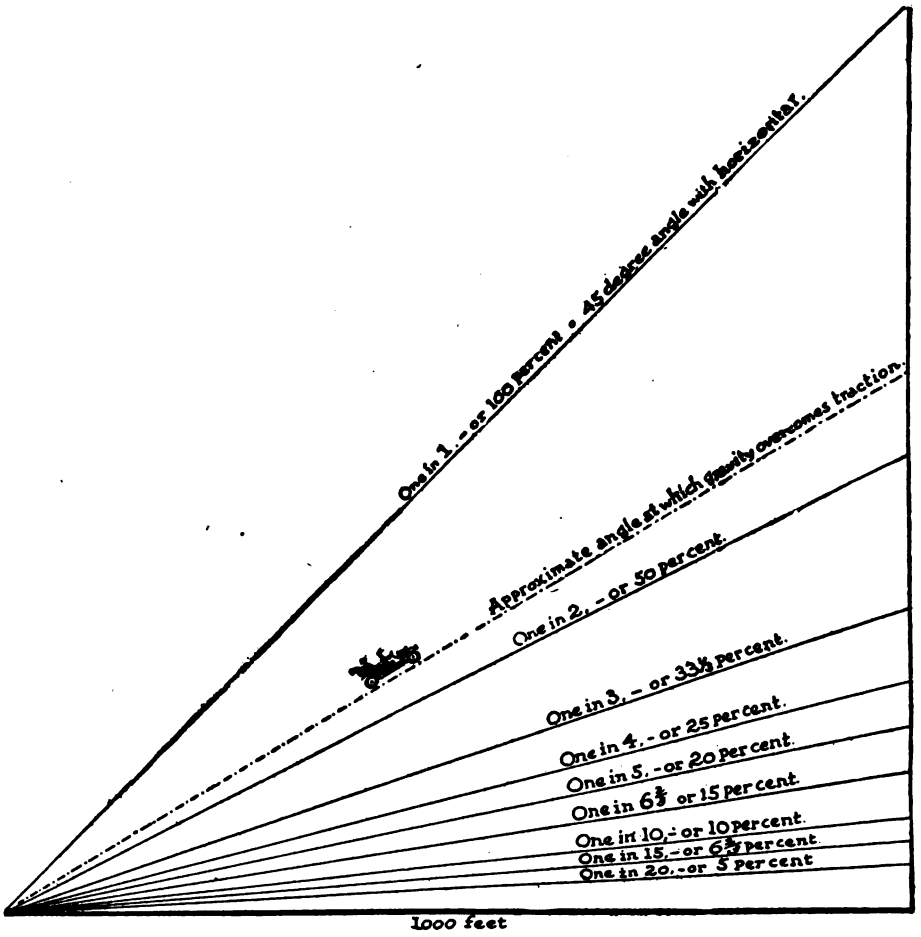
MEASUREMENT OF GRADES



ILLUSTRATING METHOD OF CALCULATING GRADE PERCENTAGES

If it be assumed that the base of the triangle represents a line 1,000 feet long and that the first sloping line represents a road having a rise that brings it 50 feet above the starting point, this is figured as 50 feet in a thousand, or 5 per cent. In other words. one foot of rise for every 20 feet, but the latter distance does not mean distance actually traveled by a car in ascending such a slope, but distance measured horizontally with reference to that slope. The grade is measured by the tangent of the angle of inclination and not by its sine, so that a grade which represents 100 per cent. corresponds to an angle of inclination of but 45 degrees, and not 90 degrees, or perpendicular, as is commonly supposed. At the upper end of the next sloping line the elevation would amount to 66 2/3 feet, which is equivalent to a rise of 6 2/3 feet for each 100 feet traveled horizontally. So one in three corresponds to a 33 1/3 per cent. grade, one in two to a 50 per cent. grade, and so on until a 100 per cent. grade is reached, which, as noted, is the equivalent of a 45 degree angle.

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¶ From the best selected material—

¶ In the shortest possible time.

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Connecting Rods, Complete — From Drop Forgings. Machined ready for assembly.

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TABLE OF GRADIENTS

GRADE		Equal to Angle of	Rise or Fall in One Mile, Feet
Per Cent	Units		
20	1 in 5	11° 19′	1056
17	1 " 6	9° 26′	880
14	1 " 7	8° 09′	754
12.5	1 " 8	7° 08′	635
11	1 " 9	6° 17′	586
10	1 " 10	5° 43′	528
9	1 " 11	5° 11′	480
8	1 " 12	4° 46′	440
7.75	1 " 13	4° 24′	406
7	1 " 14	4° 05′	337
6.5	1 " 15	3° 49′	352
6.25	1 " 16	3° 35′	330
6	1 " 17	3° 22′	310
5.5	1 " 18	3° 11′	293
5	1 " 19	3° 00′	277
5	1 " 20	2° 52′	204
4	1 " 25	2° 18′	218
3.3	1 " 30	1° 55′	155
2.8	1 " 35	1° 38′	151
2.5	1 " 40	1° 26′	132

COMPOUND EQUIVALENTS

Atmosphere (14.7 lbs. per square inch) = 1.0335 kilogrammes per square centimetre.
1 Foot-pound = 0.1382 kilogrammetre.
1 lb. per square inch = 0.0703077 kilogramme per square centimetre = 0.7031 gramme per square millimetre = 5.170 centimetres of mercury at 0 degrees Centigrade.
1 Kilogramme per square millimetre = 1422.32 lbs. per square inch = 0.635 ton per square inch.
1 Kilogramme per square centimetre = 14.2232 lbs. per square inch.
1 Gramme per square millimetre = 1.422 lbs. per square inch.
1 Kilogrammetre = 7.233 foot-pounds.
1 Gramme per square centimetre = 0.01422 lb. per square inch.
1 Calorie or French unit of heat = 3.968 British Thermal Units.
French mechanical equivalent of heat (425 kilogrammetres) = 3,074 foot-pounds per unit.
1 Calorie per square metre = 0.369 heat-unit per square foot.
1 Calorie per kilogramme = 1.800 heat-units per lb.
English unit of heat, or heat-unit = 0.252 calorie.
English mechanical equivalent to one heat-unit (778 foot-pounds) = 10.67 kilogrammetres
1 English heat-unit per square foot = 2.713 calories per square metre.
1 English heat-unit per lb. = 5.9 calorie per kilogramme.

Index to Tables and Data appears on Pages 41 to 44.

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The name of the best radiator

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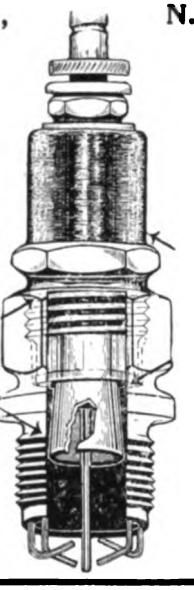

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AUTO FOLDING
STEEL CHAIR

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Seat and back rest upholstered in black. water-proof art leather—
Seat 11x12 inches—Back 12½x3½ inches.
Height of seat 16 inches—Folded 12½x20x2 inches.
Strong—safe—convenient—comfortable.
A most practical auxiliary seat for automobile touring use.

Folds Neat and Compact.

Trade supplied by the leading Jobbers

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IMPERIAL BIT & SNAP CO.
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Pronounced the Best Lubricant for Transmission and Rear Axle Gearing

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GEAR SHIELD

THE IRONSIDES COMPANY
Office, The Wyandotte Bldg.
COLUMBUS, OHIO, U. S. A.

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USEFUL ENGINEERING DATA

Gasoline has a specific gravity of .72, and consequently weighs 5.96 pounds per gallon This applies to 76° gasoline.

A foot-pound represents the work required to raise a weight of one pound to a height of one foot. There are 33,000 foot-pounds to a horsepower.

A British Thermal Unit represents the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near 39° F. Its symbol is B. T. U.

There are 778 foot-pounds in a B. T. U.

There are 42.4 B. T. U. to a horsepower.

The thermal efficiency of a good internal combustion motor is from 30 to 35 per cent.

The mechanical efficiency of a good internal combustion motor should be between 85 and 90 per cent.

On direct drive, with an efficient transmission and differential, about 88 per cent. of the power furnished by the motor should be delivered at the rear wheels.

Under the best conditions, about 75 per cent. of the indicated horsepower of the engine should be available for useful work.

If the work performed at the rear wheels is reduced to heat units, it will be found that about 23 per cent. of the energy represented by the heating value of the fuel is available as useful work.

The piston speed of a motor should not exceed 1,000 feet per minute.

The peripheral velocity of a cast iron flywheel should not exceed 5,000 feet per minute. Should it exceed this speed, there would be danger of the flywheel bursting from centrifugal force.

USEFUL FUNCTIONS OF π

$\pi = 3.14159265$	$\frac{\pi}{7} = 0.44879895$	$\pi^2 = 9.86960440$	$\sqrt{\pi} = 1.77245385$
$\frac{\pi}{2} = 1.57079633$	$\frac{\pi}{16} = 0.19634954$	$\pi^3 = 31.00627668$	$\sqrt{\pi} = 1.46459189$
$\frac{\pi}{3} = 1.04719755$	$\frac{\pi}{24} = 0.13089969$	$\frac{1}{\pi} = 0.31830989$	$\frac{1}{\sqrt{\pi}} = 0.56418958$
$\frac{\pi}{4} = 0.78539816$	$\frac{\pi}{32} = 0.09817477$	$\frac{1}{\pi^2} = 0.10132118$	$\frac{1}{\sqrt[3]{\pi}} = 0.68278406$
$\frac{\pi}{6} = 0.52359878$	$\frac{\pi}{180} = 0.01754329$	$\frac{1}{\pi^3} = 0.03225153$	$\text{Log } \pi = 0.49714987$

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Automobile and Gasoline Engine Supplies

Vesta Storage Batteries
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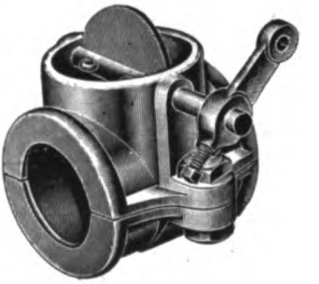
"RUDIE" CUT-OUT



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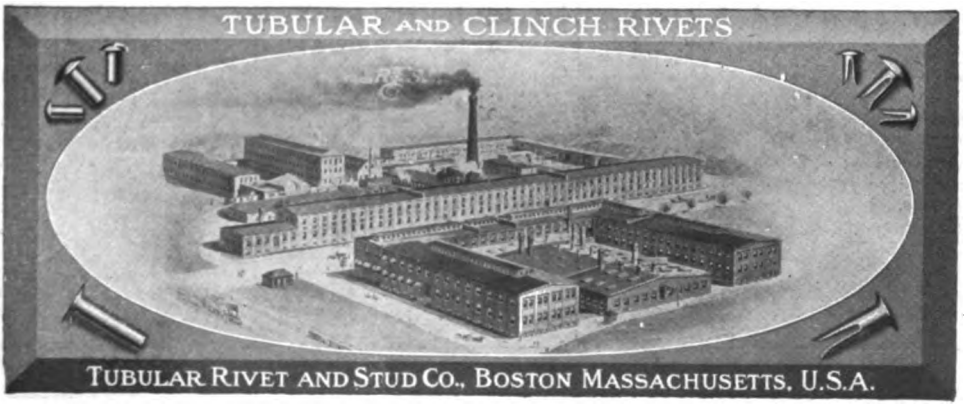

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PROPORTIONS OF ATMOSPHERIC AIR

(1) To find the quantity of nitrogen by volume corresponding to one volume of oxygen, multiply by 3.77092.

(2) To find the quantity of oxygen by volume corresponding to one volume of nitrogen, multiply by 0.265182.

(3) To find the quantity of nitrogen by weight corresponding to one part by weight of oxygen, multiply by 3.313022.

(4) To find the quantity of oxygen by weight corresponding to one part by weight of nitrogen, multiply by 0.301839.

(5) To find the quantity of nitrogen by volume corresponding to one part by weight of oxygen, multiply by 2.6365411.

(6) To find the quantity of oxygen by volume corresponding to one part by weight of nitrogen, multiply by 0.2730071.

(7) To find the quantity of nitrogen by weight corresponding to one part by volume of oxygen, multiply by 3.6629154.

(8) To find the quantity of oxygen by weight corresponding to one part by volume of nitrogen, multiply by 0.3792848.

Formula for correcting the volume of gases for temperature and pressure:

$$\frac{V}{V^1} = \frac{(273+t)P^1}{273+t^1P}.$$

When,

V = original volume;
V^1 = corrected volume;
t = original temperature in degrees Centigrade;
t^1 = final temperature in degrees Centigrade;
P = original pressure;
P^1 = final pressure;
273 = absolute temperature in degrees Centigrade.

Absolute temperature, if measured in Fahrenheit units, instead of in Centigrade as above given, would be 491.13 below the melting point of ice. The volume of a perfect gas increases 1/273 of its volume at 0 degrees Centigrade for every increase of 1 degree on the same scale. According to this, absolute zero corresponds to the temperature at which the same perfect gas would reduce to nothing.

COMBUSTION CONSTANTS OF VARIOUS GASES AND FUELS

	Atomic Weight Hydrogen=1	Molecular Weight H_2=2	Specific Gravity at 32° F. and Atmospheric Pressure Water=1	Density in Pounds per Cubic Foot	Specific Heat at Constant Pressure	Specific Heat at Constant Volume	Coefficient of Expansion of Volume at Constant Pressure per Deg. Centigrade	Coefficient of Expansion of Volume at Constant Pressure per Deg. Fahrenheit	British Thermal Units Given Out During Combustion with Oxygen
Air	.....	.....	.00130	.0809	.2377	.1690	.003665	.002036	.....
Carbon	11.97	.....	2.33	.....	.2411	.....	.....	.....	14,540
Carbonic acid gas	.....	CO^2 43.89	.00198	.1225	.2164	.1535	.003688	.002049	.....
Carbonic oxide	.....	CO 27.93	.00126	.0784	.2479	.1758	.003667	.002037	4,370
Coal gas (average)	.....	.....	.00054	.0335	.....	.....	.....	.....	17,800
Hydrogen	1	H_2 – 2	.00009	.0056	3.4046	2.414	.003667	.002037	61,260
Methane	.....	CH_4 15.97	.00072	.0448	.5929	.4701	.....	.....	26,400
Oxygen	15.96	O_2 31.92	.00144	.0896	.2182	.156	.....	.....	.....
Steam at 212° F.	.....	H_2O 17.96	.0008	.05	.4750	.34	.....	.....	.....
Refined petroleum	.....	.....	.8	.....	.....	.....	.....	.....	22,000
Crude petroleum	.....	.....	.9	.....	.....	.....	.....	.....	20,000

Specific heat of gas engine exhaust gases = .258 at constant pressure and .189 at constant volume.

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Platinum Iridium

Contact Points

FOR

MAGNETOS

COILS

VIBRATORS

Manufactured by

GEO. MEIKLE

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SPECIFIC HEAT OF HYDROCARBONS

In order to be able to estimate the losses in the exhaust of a motor it is necessary to know the specific heat of the elements and compounds determined by analysis of the exhaust, together with the range of temperatures, as well as the weight of the exhaust gases. The specific heat values are as follows:

Elements and Compounds	Specific Heat
Carbon	0.241
Carbon monoxide	0.2479
Oxygen	0.218
Hydrogen	0.244
Nitrogen (approximately)	0.240

Since over 80 per cent. of the whole weight of gas (mixture) will be nitrogen, it follows that much of the heat lost to the exhaust is taken away in the nitrogen. This fact, coupled with the absence of heat value, in nitrogen, tends to the contention that nitrogen is an evil without a recompense. In the absence of nitrogen, however, the fuel would be so quick-burning that the pistons would not be capable of receding rapidly enough to enable the functions to be performed, and it follows that some element has to be present, the nature of which will serve to dampen the rate of flame propagation. Nitrogen is at hand in the right proportion and the cost of its provision is therefore nil, since, as exemplified above, it has no heat value.

PROPERTIES OF SOME OF THE HYDROCARBONS

Name	Per Cent. of Carbon	Per Cent. of Hydrogen	Boiling Point—Fahr.	Specific Gravity	Vapor Density
Pentane	83.20	16.71	87	.640	2.538
Hexane	83.68	16.32	143	.676	3.053
Heptane	83.90	16.04	165	.718	3.547

PROPERTIES OF GASES

(1*)	(2*)	(3*)	(4*)	(5*)
Hydrogen	H	.0692	.00559	52230
Oxygen	O	1.106	.08921	.....
Nitrogen	N	.971	.07831	.....
Carbon Monoxide	CO	.967	.07807	4380
Carbon Dioxide	CO_2	1.529	.12267	.....
Dry Air	.....	1.000	.08072	.....
Water Vapor	H_2O	.625	.05020	.....
Acetylene	C_2H_2	915	.07251	20673
Methane	CH_4	.554	.04464	21385
Ethylene	C_2H_2	.974	.07805	20025
Alcohol	C_2H_6O	1.601	.12598	12000

*1 Gases.
*2 Chemical Formula or Symbol.
*3 Density (Air = 1).
*4 Weight per cubic foot under standard conditions.
*5 Heating values per pound in B. T. U.

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Manufacturers of

Hydraulic Presses, Motor Drive Presses, Belt Driven Presses, Hand Power Presses, Button Holders, Plaiters and Mould Boards for Automobile Work.

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TABLE OF ELECTRICAL HORSEPOWER

Amperes

Volts	1	10	20	30	40	50	60	70	80	90	100	110
1	.00134	.0134	.0268	.0402	.0536	.0670	.0804	.0938	.1072	.1206	.1341	.1475
5	.00670	.0670	.1341	.2011	.2681	.3351	.4022	.4692	.5362	.6032	.6703	.7373
10	.01341	.1341	.2681	.4022	.5362	.6703	.8043	.9383	1.072	1.206	1.341	1.475
15	.02011	.2011	.4022	.6032	.8043	1.005	1.206	1.408	1.609	1.810	2.011	2.212
20	.02681	.2681	.5362	.8043	1.072	1.340	1.609	1.877	2.145	2.413	2.681	2.949
25	.03351	.3351	.6703	1.005	1.341	1.676	2.011	2.346	2.681	3.016	3.351	3.686
30	.04022	.4022	.8043	1.206	1.609	2.011	2.413	2.815	3.217	3.619	4.022	4.424
35	.04692	.4692	.9384	1.408	1.877	2.346	2.815	3.284	3.753	4.223	4.692	5.161
40	.05362	.5362	1.072	1.609	2.145	2.681	3.217	3.753	4.290	4.826	5.362	5.898
45	.06032	.6032	1.206	1.810	2.413	3.016	3.619	4.223	4.826	5.439	6.032	6.635
50	.06703	.6703	1.341	2.011	2.681	3.351	4.022	4.692	5.362	6.032	6.703	7.373
75	.10054	1.005	2.011	3.016	4.021	5.027	6.032	7.037	8.043	9.048	10.05	11.06
100	.13405	1.341	2.681	4.022	5.362	6.703	8.043	9.384	10.72	12.06	13.41	14.75
500	.67025	6.703	13.41	20.11	26.81	33.51	40.22	46.92	53.62	60.32	67.03	73.73
1,000	1.3405	13.41	26.81	40.22	53.62	67.03	80.43	93.84	107.2	120.6	134.1	147.5
5,000	6.7025	67.03	134.1	201.1	268.1	335.1	402.2	469.2	536.2	603.2	670.3	737.3
10,000	13.405	134.1	268.1	402.2	536.2	670.3	804.3	938.3	1072.	1206.	1341.	1475.

Rule: $\frac{\text{Volt} \times \text{Ampere}}{746} = \text{H P.}$

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THE NOKOLYD SIGNAL
SELLS ITSELF

Its simplicity of operation, its absolute accuracy, and the perfect protection it offers appeal to every motorist.
The NOKOLYD SIGNAL indicates electrically—

STOP—RIGHT—LEFT

without removing the hand from the steering wheel, and is illuminated by night.
Price, $20.00 complete.

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Cut upon automatic machines, to suit the most exacting requirements. We cut worm gears of any diameter, lead, pitch or number of threads in worm.

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Lubricants
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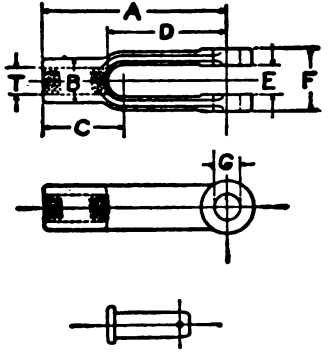
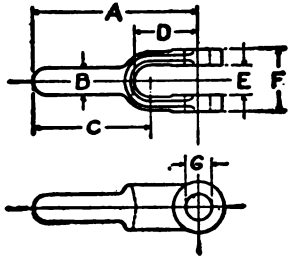
YOKE AND EYE ROD ENDS (*S. A. E. Standard*)

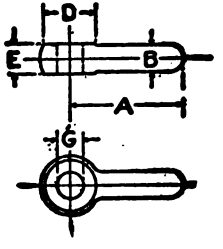
Adjustable Yoke Ends



Plain Yoke Ends



Rod Ends



A	B	C	D	E	F	G	T
1 9/16	5/16	1 1/16	1	3/16	7/16	3/16	3/16 32 U. S.
2	7/16	7/8	1 1/4	9/32	5/8	1/4	1/4 28 A.L.A.M.
2 1/4	1/2	1	1 7/16	11/32	3/4	5/16	5/16 24 A.L.A.M.
2 1/2	5/8	1 1/8	1 5/8	7/16	7/8	3/8	3/8 24 A.L.A.M.
2 7/8	23/32	1 1/4	1 7/8	1/2	1	7/16	7/16 20 A.L.A.M.
3	13/16	1 7/16	1 7/8	9/16	1 1/8	1/2	1/2 20 A.L.A.M.

A	B	C	D	E	F	G
1 1/4	3/16	7/8	7/16	3/16	7/16	3/16
1 3/4	1/4	1 1/4	5/8	9/32	5/8	1/4
2	5/16	1 3/8	3/4	11/32	3/4	5/16
2 1/8	3/8	1 7/16	27/32	7/16	7/8	3/8
2 1/4	7/16	1 1/2	1	1/2	1	7/16
2 1/2	1/2	1 5/8	1 1/8	9/16	1 1/8	1/2

A	B	D	E	G
1 3/4	3/16	3/8	3/16	3/16
1 1/4	1/4	1/2	9/32	1/4
1 3/8	5/16	19/32	11/32	5/16
1 1/2	3/8	21/16	7/16	3/8
1 1/2	7/16	13/16	1/2	7/16
1 3/4	1/2	15/16	9/16	1/2

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TIRES FOR
EVERY SERVICE

The high quality of material and workmanship that is maintained in the manufacturing of 24 different types of tires offers you the most complete line manufactured—a tire for every condition of service. There is big profit in handling such a line.

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Attractive proposition to dealers

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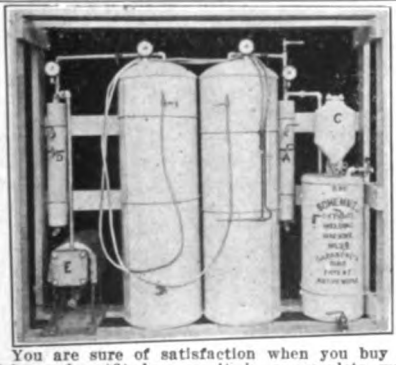


You are sure of satisfaction when you buy a Schemmel outfit because it is a complete machine. In generating its own gases you are saved the annoyance of sending empty drums to the factory, shipping delays and the constant bother of changing drums while welding, and it is cheaper to make your own gas.

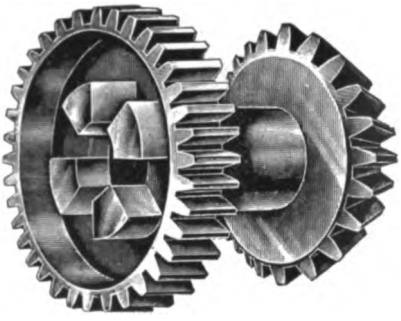
And remember this point carefully—the Schemmel is a SOFT welding machine. Schemmel-made welds remain soft and can be drilled, filed or machined as well after welding as before.

Nor will you have the least trouble with the Schemmel torch—the only torch with a DOUBLE MIXING CHAMBER which neutralizes the flame and keeps the metal in its original state. Not only can you use the Schemmel outfit for welding and carbon removing but it will also do babbitting and cement cutting.

We also manufacture a Regulator Outfit. Write for prices. We do all kinds of welding; send us all the work you can gather up, we allow you a liberal commission. If you have a welding machine send me the work you do not care to do.

Schemmel Welding Machine Works

Write for Catalogue Wapakoneta, Ohio



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Case-Hardening of all descriptions. Phosphor Bronze, Imported Alloy Steel for the making of High Class Gears and Axles of all descriptions.

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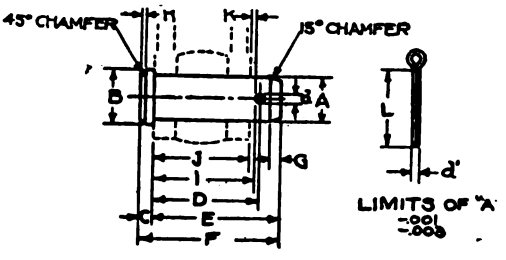
YOKE AND EYE ROD END PINS (*S. A. E. Standard*)



A	B	C	D	E	F	G	H	I	S.A.E. Standard Yoke J	K	Cotter d¹	Cotter L	d = Drill No.	d = Drill Dia.	Diff. d—d¹	Diff. + k*
$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{16}$	$\frac{31}{64}$/ .4844	$\frac{19}{32}$	$\frac{21}{32}$	$\frac{3}{64}$	$\frac{1}{64}$	.4464	$\frac{7}{16}$/.4375	.0089	$\frac{1}{16}$/.0625	$\frac{5}{16}$	48	.076	.0135	.0224
$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{32}$	$\frac{43}{64}$/ .6719	$\frac{51}{64}$	$\frac{57}{64}$	$\frac{1}{16}$	$\frac{1}{32}$	.6339	$\frac{5}{8}$/ .625	.0089	$\frac{1}{16}$/.0625	$\frac{7}{16}$	48	.076	.0135	.0224
$\frac{5}{16}$	$\frac{7}{16}$	$\frac{3}{32}$	$\frac{13}{16}$/ .8125	$\frac{31}{32}$	$1\frac{1}{16}$	$\frac{5}{64}$	$\frac{1}{32}$	.7595	$\frac{3}{4}$ /.750	.0095	$\frac{3}{32}$/.0937	$\frac{1}{2}$	36	.106	.0123	.0218
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{15}{16}$/ .9375	$1\frac{3}{32}$	$1\frac{7}{32}$	$\frac{5}{64}$	$\frac{1}{32}$	.8845	$\frac{7}{8}$ /.875	.0095	$\frac{3}{32}$/.0937	$\frac{5}{8}$	36	.106	.0123	.0218
$\frac{7}{16}$	$\frac{9}{16}$	$\frac{5}{32}$	$1\frac{1}{16}$/1.0625	$1\frac{15}{64}$	$1\frac{25}{64}$	$\frac{3}{32}$	$\frac{3}{64}$	1.0095	1 /1.000	.0095	$\frac{3}{32}$/.0937	$\frac{3}{4}$	36	.106	.0123	.0218
$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{32}$	$1\frac{13}{64}$/1.2031	$1\frac{27}{64}$	$1\frac{37}{64}$	$\frac{7}{64}$	$\frac{3}{64}$	1.1331	$1\frac{1}{8}$/1.125	.0081	$\frac{1}{8}$ /.125	$\frac{7}{8}$	28	.140	.0150	.0231

All dimensions in inches.
*Total clearance yoke to cotter.

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GENERAL DROP FORGE CO.

SPECIAL DROP FORGINGS OF ALL KINDS TO ORDER

SEND US PRINTS OR MODELS FOR PRICES

BUFFALO, N.Y.

EAGLEINE AUTO OILS

LIGHT, MEDIUM, HEAVY, EXTRA HEAVY

Oils that lubricate where others fail, produce less carbon, furnish more mileage. A grade furnished adaptable to your conditions. Our special chart book sent on request.

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LOCK WASHER DIMENSIONS (*S. A. E. Standard*)

The outside diameters of lock washers shall coincide practically with the long diameters of S. A. E. Standard nuts, which are approximately the short diameters of United States Standard nuts.

The inside diameters of the lock washers shall be from 164″ to 132″ larger than bolt diameters. All lock washers shall be parallel-faced sections; and bulging or malformed ends must be avoided.

Table of Sizes

Automobile Heavy (A. H.)

For General Use

Bolt Diameter	Lock Washer Section	Bolt Diameter	Lock Washer Section
3/16″	1/16″x 1/16″	11/16″	1/4″x 1/4″
1/4″	5/64″x 5/64″	3/4″	1/4″ x 1/4″
5/16″	1/8″ x 1/8″	7/8″	17/64″x17/64″
3/8″	1/8″ x 1/8″	1″	5/16″x 5/16″
7/16″	11/64″x11/64″	1 1/8″	5/16″x 5/16″
1/2″	11/64″x11/64″	1 1/4″	3/8″ x 3/8″
9/16″	13/64″x13/64″	1 3/8″	3/8″ x 3/8″
5/8″	13/64″x13/64″	1 1/2″	7/16″x 7/16″

Automobile Light (A. L.)

For Optional Use Against Soft Metal

Bolt Diameter	Lock Washer Section
3/16″	1/16″x3/64″
1/4″	5/64″x1/16″
5/16″	1/8″ x3/32″
3/8″	1/8″ x3/32″
7/16″	11/64″x1/8″
1/2″	11/64″x1/8″
9/16″	13/64″x5/32″
5/8″	13/64″x5/32″
11/16″	1/4″ x3/16″
3/4″	1/4″ x3/16″
7/8″	17/64″x3/16″
1″	5/16″x1/4″

Test

Temper

After compression to flat, reaction shall be sufficient to indicate necessary spring power, and on a subsequent compression to flat the lock washer shall manifest no appreciable loss in reaction.

Toughness

Forty-five per cent. of the lock washer, including one end, shall be firmly secured in a vise, and forty-five per cent., including the other end, shall be secured firmly between parallel jaws of a wrench. Movement of the wrench at right angle to helical curve shall twist the lock washer through forty-five degrees without sign of fracture; and shall twist the lock washer entirely apart within one hundred and thirty-five degrees.

OVERSIZE CYLINDERS (*S. A. E. Standard*)

There has hitherto existed no uniform practice as to the amount of metal removed in regrinding worn cylinders, with the result that difficulty is experienced in securing new pistons of correct size, from the manufacturers.

With a view to eliminating all unnecessary expense and delay, the following standards have been accepted by the Society:—

Ten Thousandths	(.010″)	inch	large	for	first	oversize	standard
Twenty "	(.020″)	"	"	"	second	"	"
Thirty "	(.030″)	"	"	"	third	"	"
Forty "	(.040″)	"	"	"	fourth	"	"

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ENTZ
ELECTRIC TRANSMISSION
Manufactured by
GENERAL ELECTRIC COMPANY
Licenses Granted to Auto Manufacturers
by the
ENTZ MOTOR PATENTS CORP.
57th & Broadway New York

"V D & D" QUALITY GEARS
Bevels, Spurs, Spiral Bevels, Differentials
"V. D. & D." Gears are specified by the most progressive automobile builders in the country because by experience they know "V. D. & D." Gears are absolutely dependable.
THE VAN DORN & DUTTON CO.
GEAR SPECIALISTS
NEW YORK CLEVELAND SAN FRANCISCO

BLUE EDGE
BEST BRAKE LINING
WOVEN STEEL HOSE & RUBBER CO.
TRENTON N.J.

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Red Head
SPARK PLUGS
AND
Ever Good
MOTOR NECESSITIES
Guaranteed Forever
Write for Catalog
EMIL GROSSMAN MFG. CO., Inc.
Bush Term'l, Model Factory No. 20
Brooklyn, N.Y. Chicago, 1253 Mich. Ave.

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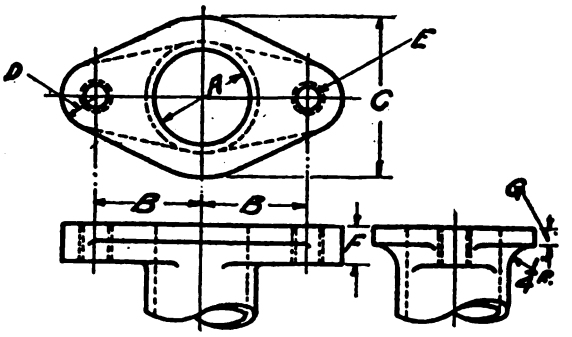
CARBURETER FITTINGS (*S. A. E. Standard*)

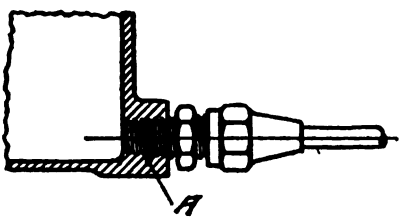
FLANGES



Carbureter Size	A	B	C	D	E *	F	G
3/4	15/16"	1 1/16"	1 5/8"	11/32"	5/16"x18 thr.	3/8"	1/8"
7/8	1 1/16"	1 1/8"	1 3/4"	11/32"	5/16"x18 thr.	3/8"	1/8"
1	1 3/16"	1 3/16"	1 7/8"	11/32"	5/16"x18 thr.	13/32"	5/32"
1 1/4	1 7/16"	1 11/32"	2 3/16"	13/32"	3/8" x16 thr.	15/32"	3/16"
1 1/2	1 11/16"	1 15/32"	2 1/2"	13/32"	3/8" x16 thr.	15/32"	3/16"
1 3/4	1 15/16"	1 21/32"	2 13/16"	15/32"	7/16"x14 thr.	9/16"	7/32"
2	2 3/16"	1 25/32"	3 1/8"	15/32"	7/16"x14 thr.	9/16"	7/32"

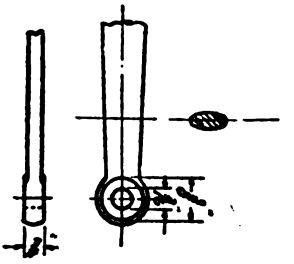
*U. S. Standard thread.
All dimensions in inches.

GASOLINE PIPE SIZES

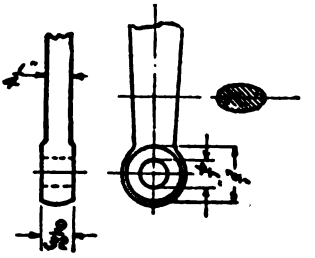


Carbureter Size	A, Briggs Standard. Pipe Thread
3/4"	1/8"
7/8"	1/8"
1"	1/8"
1 1/4"	1/4"
1 1/2"	1/4"
1 3/4"	1/4"
2"	1/4"

THROTTLE LEVERS



3/16" Rod end for carbureters up to 1 inch



1/4" Rod end for carbureters of 1 1/4 to 2 inches inclusive

(*Continued on page* 832)

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SPRINGS

Send for Price Chart of Springs and Spring Clips Carried in Stock

All sizes—any style—ready for immediate delivery in any quantity.

Our list indicates the proper spring and spring assembly for all models of American made cars.

Complete with prices and all information to simplify correct buying.

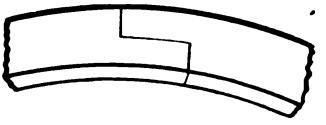
Champion Auto Spring Co.

3128 Locust Street

ST. LOUIS, MO.

ECO STEP LAP PISTON RINGS

The Rings of Quality



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Prompt shipments and satisfaction guaranteed.

Send for our blue-book containing valuable information for the manufacturer, dealer and repairman.

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GEARS AXLES CRANKS

Our forgings are made The Champion Way—the *right* way. Some forgings we make without draft—Spring Hangers, Engine Brackets, Etc.

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CLEVELAND, OHIO

NEW YORK OFFICE, - 30 Church Street
CHICAGO OFFICE, 1623 Monadnock Block
PHILADELPHIA OFFICE, Bourse Building

When purchasing a speedometer you aim to purchase accuracy. Not approximate accuracy but absolute accuracy. The

CORBIN-BROWN-SPEEDOMETER

"The Speedometer of Absolute Accuracy"

possesses those essentials of principle and construction without which no speedometer can properly perform its functions.

Investigate of your dealer today. Catalog on request.

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The American Hardware Corporation, Successor
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Branches: New York Chicago Philadelphia

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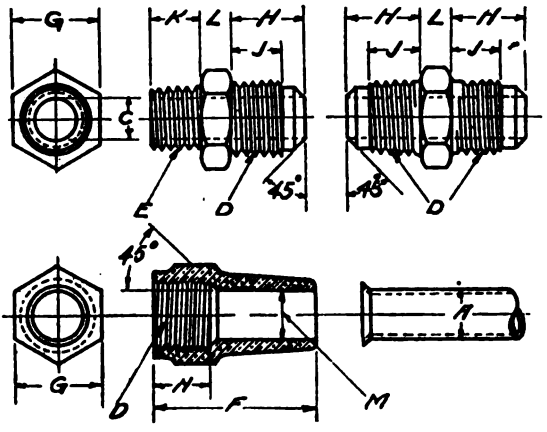
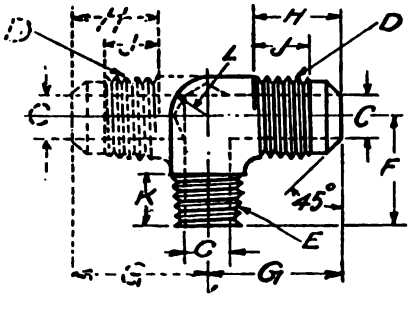
CARBURETER FITTINGS (*S. A. E. Standard*)

FLARED TUBE UNIONS



A	Pipe diameter.....	1/4	5/16	3/8	7/16	1/2
C	Bore, male part.....	3/16	7/32	9/32	5/16	13/32
D	S. A. E. thread.....	7/16x20 thr.	1/2x20 thr.	5/8x18 thr.	11/16x16 thr.	3/4x16 thr.
E	Pipe thread.....	1/8	1/8	1/4	1/4	3/8
F	.....	15/16	1 1/8	1 5/16	1 1/2	1 5/8
G	.....	9/16	5/8	3/4	13/16	7/8
H	.....	1/2	9/16	5/8	11/16	3/4
J	Thread only.....	11/32	3/8	13/32	7/16	1/2
K	Thread only.....	3/8	3/8	7/16	7/16	1/2
L	.....	3/16	7/32	1/4	9/32	5/16
M	Bore, female part.....	0.255–0.260	0.317–0.322	0.380–0.385	0.442–0.447	0.505–0.510
N	.....	11/32	3/8	7/16	1/2	9/16

FLARED TUBE ELLS AND TEES



A	Tube diameter.....	1/4	5/16	3/8	7/16	1/2
C	Drill diameter.....	3/16	7/32	9/32	5/16	13/32
D	S. A. E. thread.....	7/16x20	1/2x20	5/8x18	11/16x16	3/4x16
E	Briggs std. pipe thread..	1/8	1/8	1/4	1/4	3/8
F	Center to face.....	3/4	3/4	7/8	15/16	1
G	Center to face.....	7/8	15/16	1	1 1/8	1 3/16
H	.....	1/2	9/16	5/8	11/16	3/4
J	Thread only.....	11/32	3/8	13/32	7/16	1/2
K	Thread only.....	3/8	3/8	7/16	7/16	1/2
L	Radius.....	1/8	1/4	9/32	5/16	11/32

All dimensions on this sheet in inch measure.

Index to Tables and Data appears on Pages 41 to 44.

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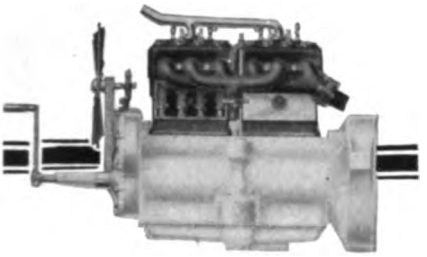

NORTH AMERICAN MOTORS

Model D

45 H. P. at 1200 RPM.
A. L. A. M.

A long stroke, heavy duty motor designed and standardized for 3 and 4 ton truck service.
Cylinders—L-Head, cast in pairs, interchangeable and supported on barrel type aluminum crankcase with extra heavy arms cast integral for 3 point suspension.
Oiling—Full splash type—pump feed.
Cooling—Forced circulation by centrifugal pump driven by countershaft.
Ignition—Magneto, mounted on bracket and driven off pump shaft.
Timing—Camshaft driven by silent chain from crankshaft.
Detailed specifications upon request.

North American Motor Company
POTTSTOWN, PA.

PENMAID

Automobile Gears and Sprockets give you the best material, finest workmanship and unexcelled service.

Bevel Gears cut theoretically correct. We make Spur, Worm, Spiral, Mitre, Internal Gears.

SPROCKETS FOR ALL MOTOR TRUCKS
Heat Treating of Every Description

PENNSYLVANIA GEAR AND MACHINE CO.
435 North Broad Street Philadelphia, Pa.

PFANSTIEHL STARTER COIL

A supplementary vibrating coil which interrupts (vibrates) the primary ignition circuit several times for each opening of the magneto or distributor circuit breaker, thus supplying a shower or series of sparks to each spark plug when its piston is in firing position and making starting easier with cold, lean or low grade fuel mixtures. The Pfanstiehl Starter Coil may be used with any standard ignition system—magneto, battery, or magneto and battery. It is made with switch for mounting on dash or without switch for mounting under the hood. Write for catalog and wiring diagrams showing connections for all ignition systems.

PFANSTIEHL CO.
NORTH CHICAGO - ILLINOIS

DEALERS WANTED

for the new non-skid

PHARIS PACKARD TIRES

the latest addition to the unequalled PHARIS PACKARD line. Made to be superior to any other tire on the market, and give such complete satisfaction as to be certain producers of repeat orders.

If you wish to handle tires where the money has been spent to make *the tire good* instead of *"for printers' ink,"* you want to write for the Pharis-Packard agency.

Get a few out, and your customers will soon prove to you that you have *the* tire for service, satisfaction and sales.

Write today for territory.

The Pharis Tire & Rubber Co.
Newark, Ohio

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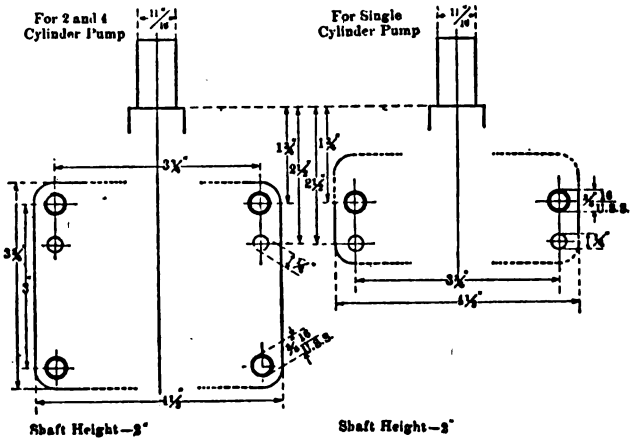
MECHANICALLY DRIVEN AIR PUMP MOUNTING DIMENSIONS

(S. A. E. Standard)

Shaft height	2"
Shaft diameter	11/16"
Width of base (right angle to crankshaft)	4 1/2"
Length of base of two and four-cylinder pumps (parallel to crankshaft)	3 3/4"
Distance from center of front baseplate holes to shoulder of shaft	1 3/4"
Distance between centers of baseplate holes:	
At right angle to crankshaft	3 3/4"
Parallel to crankshaft	3"
Baseplate hole thread	3/8-16 U. S. S.
Dowels, two	1/4"

3¾" c to c, placed between pair of baseplate holes located on each side of crankshaft, and on a line 2½" from shoulder of shaft.



MAGNETO MOUNTING DIMENSIONS *(S. A. E. Standard)*

For Four- and Six-Cylinder Engines

	Mm.	Inches
Shaft height	45.	1.771
Distance from center of front base-plate holes to large end of shaft taper	53.	2.086
Distance from center of front base plate holes to center of rear base-plate holes	50.	1.968
Distance between centers of base-plate holes left to right	50.	1.968
Large diameter of taper	15.	0.590
Small diameter of taper	12.	0.472
Length of taper	15.	0.590
Taper 1:5 (included angle) 11 deg. 30 min. approx. Woodruff key No. 3		
Height of magneto space	203.	8.000
Length of magneto space	254.	10.000
Width of magneto space	127.	5.000
Plain hole timing lever	6.35	0.25
Tapped hole timing lever, ¼ in. 28 P., S.A.E.		
Base-plate holes—⅜ in. 16 P., U.S.S.		
Thread for end of magneto shaft ⅜ in., 16 P., U.S.S., length of thread 0.5905 in.		
Advance lever radius	2.125 in.	

Index to Tables and Data appears on Pages 41 to 44.

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QUALITY FIRST

DASH BOARDS

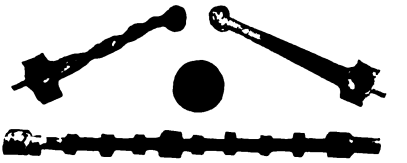
VENEERED ROOFS
Nine Different Sweeps

INLAID PANELS
For Division and Doors

WAGON SIDE PANELS
Made with No Joints

COWL BOARDS

New Jersey Veneer Co.
Paterson, N. J.



Drop Forgings of all kinds. Automobile forgings properly heat treated a specialty.

High Grade and prompt service

Also makers of Shear Knives.

Pittsburgh Knife & Forge Company
Pittsburgh, Pa.

O-So-Ezy Cedar Oil Polish

is furnished as standard equipment with Buick, Chevrolet, Winton, Maxwell, Chalmers, Paige, Reo, Detroit Electric, Oldsmobile, Hupmobile, Grant, Scripps-Booth and Saxon.

The makers of these cars made their decision only after exhaustive tests. They decided that O-SO-EZY was the best polish. Every car owner should use it.

O-So-Ezy Products Company
264-268 Jefferson Ave., Detroit, Mich.
Gold Medal—Highest Award—Panama-Pacific Exposition

Anchor Brand

NEW PATTERN
"PERFECTION"
CURTAIN FASTENERS
Patented

ONE OF MANY

These Fasteners are of highest quality workmanship and superior in every way

Patterns Carried in Stock
TWO SCREW **ONE SCREW**
CLINCH **ONE RIVET**
MACHINE SCREW

SINGLE **DOUBLE** **TRIPLE**

STEEL AND BRASS

NORTH & JUDD MFG. CO.
New Britain, Conn.

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WHEEL DIMENSIONS FOR SOLID TIRES (*S. A. E. Standard*)

Demountable and Non-demountable Rims

SINGLE TIRES

Width of felloe and band.....¾-inch less than sectional size of tire.
Thickness of steel band.....¼-inch up to 4-inch tire; ⅜-inch on 4-inch and larger tires.

DUAL TIRES

Width of felloe and band.....Twice the sectional size of tire.
Thickness of steel band.....⅜-inch for all sizes of tire.

SINGLE AND DUAL TIRES

Sectionl size of tire.....	2	2½	3	3½	4
Minimum felloe thickness.....	1¼	1¼	1½	1½	1¾
					6½
Sectional size of tire.....	4½	5	5½	6	and over
Minimum felloe thickness.....	1¾	2	2	2	2⅛

WHEEL DIAMETER OVER STEEL BAND

Single and Dual Tires

Nom. outer diam. of tires	30		32		34		36		38		40		42	
Wheel diam. over steel band.....	24		26		28		30		32		34		36	
Exact circumf. over steel band; neglecting tolerance.....	75	25/64	81	11/16	87	31/32	94	1/4	100	17/32	106	13/16	113	3/32

Allowable Deviation From Precision in Felloe Bands

	Plus	Minus
Tolerance in circumf. of band before application.....	0	1/16″
Tolerance in circumf. of band after application.....	1/16″	1/32″
Tolerance in width of band.....	1/64″	1/64″
Tolerance of thickness of band.....	0.006″	0.006″
Tolerance in radius of band after application.....	1/16″	1/16″

Circumferential deviation from precise figure must be uniform across entire width of band.

Radial deviations must not occur at diametrically opposite points, and there must be no flat spots or kinks in band on finished wheel. Either side of band when laid on a surface plate must not clear more than 1/64″ at any point.

COMMERCIAL CAR WHEEL DATA

Bolt Equipment for Side Flanges

All Bolts to be ½ Inch Diameter

Outside Diameter Tire	Diameter Bolt Hole Circle	Number of Bolts	Outside Diameter Tire	Diameter Bolt Hole Circle	Number of Bolts
26	18½	6, 9 or 18	42	34½	10, 15 or 30
28	20½	do.	44	36½	12, 18 or 36
30	22½	do.	46	38½	do.
32	24½	8, 12 or 24	48	40½	do.
34	26½	do.	50	42½	14, 21 or 42
36	28½	do.	52	44½	do.
38	30½	10, 15 or 30	54	46½	do.
40	32½	do.			

(*Continued on page* 838)

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DANN INSERT

"The Inter-leaf Shock Absorber"

Dealers: Opportunity Extraordinary

Backed by a gigantic advertising campaign, Dann Insert will be the biggest seller of the year.

Engineers, both in this country and abroad now recognize the necessity of the lubricated spring to get the resiliency necessary to promote the highest riding comfort.

At the old prices, Dann Insert was a big seller. At the new prices, it will sell like wild fire. Already the new prices have trebled the business. *Entirely new selling plan.* BIG PROFITS.

Don't wait another day! Wire, write or come to Chicago for our unprecedented proposition. It will pay you. Do it NOW, while this advertisement is before you.

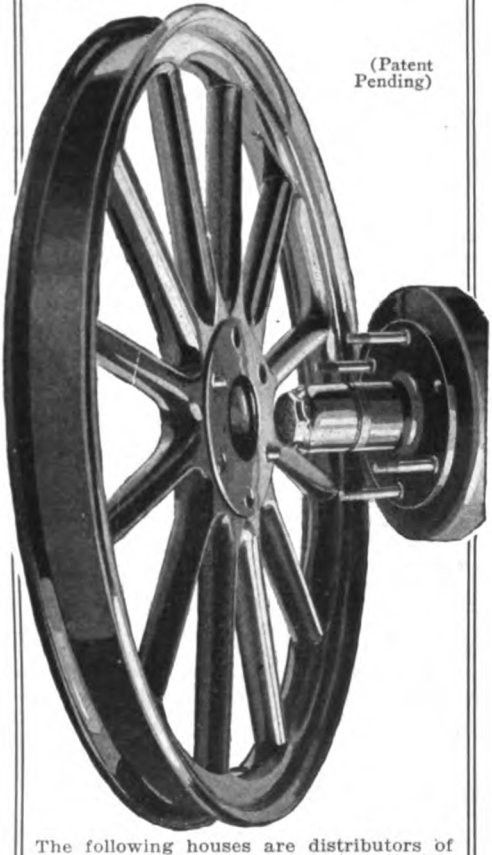
DANN PRODUCTS COMPANY,
2200 Indiana Avenue,
Chicago, Ill.

"STANDARD"

DEMOUNTABLE WHEEL SET FOR FORD CARS

A brand new invention. The most important and best selling accessory placed on the market in the last ten years. A complete set of demountable and interchangeable wheels, front and rear, at less than one-third the cost of a demountable rim outfit. A disabled wheel removed and replaced by a new one in less than four minutes.

(Patent Pending)



The following houses are distributors of this device in their respective territories. Write the nearest one for literature and prices.

A. J. Picard & Co., New York.
Jos. Strauss & Son, Buffalo.
Chanslor & Lyon Co., San Francisco.
Boice-Perrine Co., Boston, Mass.
Automobile Sundries Co., Exporters, New York, N. Y.
The Automobile Supply Co., Chicago.
Interstate Electric Co., New Orleans.
Canadian Fairbanks-Morse Co., Montreal.
Manufacturers' Supplies Co., Philadelphia, Pa.

THE STANDARD AUTO ACCESSORY CO.
Leipsic, Ohio

How Far?

Miles per gallon has become an all important factor to every class of motorists. Whether they use pleasure cars or commercial vehicles they are vitally interested in saving gasoline.

Show Them

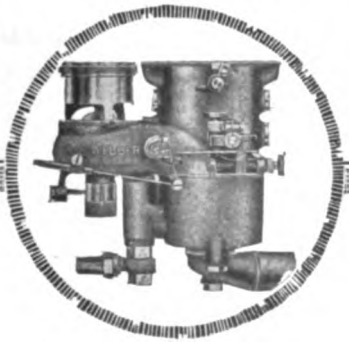
The Webber Automatic Carburetor will affect a materia saving in operating expense. It will increase the flexibility of the motor, respond instantly to every change of throttle and will prove to be more economical and altogether more satisfactory than any carburetor on the market.

WEBBER

Your Trade Will Buy It

We have a proposition for car manufacturers and accessory dealers which will increase their business. This proposition makes it easy for you to try out and thoroughly test the WEBBER. Write us about it

WEBBER MFG. CO.
66-68 Stanhope Street, Boston, Mass.
Branch: 1765 Broadway, New York



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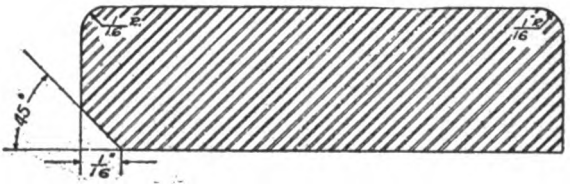
Edges of Felloe Band

Band to be rounded on the two outside edges with radius not to exceed 1/16", and one inside edge to have an angle of about 45 degrees, extending about 1/16" from the edge, as shown in the following sketch:



Measuring Circumference of Band

In measuring circumference of band, if there is not an allowance on the tapeline itself, a correction amounting to three times the thickness of the tapeline should be made.

Note.—*All of the foregoing, so far as pertinent, applies to metal wheels.*

SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS

(*S. A. E. Standard*)

Bore Tolerances

The tolerances given include the extremes for all makes of bearings, as endorsed by the ball bearing manufacturers. It has been the practice of some ball bearing manufacturers to work only to minus limits, while others work to tolerances on both sides of exact nominal sizes as to bore.

Where greater accuracy than specified by the tolerances given above is required, the same should be specified.

Definition of Eccentricity

The eccentricity of the inner race is that lack of running truth noticed upon the stationary outer race when rotating the inner race and balls upon true centers.

The eccentricity of the outer race is that lack of running truth shown upon a suitable indicator during the rotation of the outer race and balls upon the inner race fixed upon a stationary arbor

Axial Freedom

In the absence of a standard method of measuring axial freedom, no definite figures for same have been accepted.

Short Type Roller Bearings

For short type roller bearings, whether plain or taper, the same sizes of bore and outside diamater as for annular ball bearings are standard.

Length of Long Ball and Roller Bearings

No effort is considered advisable at the present time to standardize the length of the so-called long ball or roller bearings.

(*Tables of Sizes and Tolerances on page* 840)

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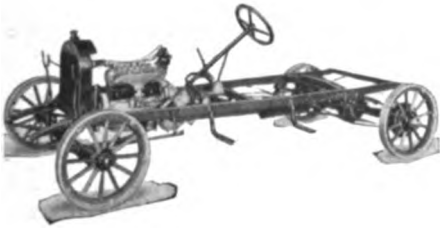
Pontiac Chassis

Automobile Manufacturers

We will furnish you with complete chassis, minus body and tires, that will enable you to put out a high-class car at a price.



The Pontiac Standard Chassis is equipped with a 27 h.p. four-cylinder motor, with L-head engine and three-speed gear set in unit. Special chassis built to order in quantities.

All Parts Are of Standard Design

Manufacturers, save initial cost and experiments by buying a tried and true chassis that is guaranteed to give you satisfaction.

Write us immediately for specifications and prices.

PONTIAC CHASSIS COMPANY
PONTIAC, MICH.

GASOLINE GAUGES

This is the gauge with the MERCURY SEAL you hear so favorably talked about. No gasoline can leak into the dial chamber to fog the crystals or discolor the dial, because we pack the indicator stem in mercury held in a recess formed in the gauge body.

Notice our dependable construction, the sturdy float guides firmly mounted, the float spiral securely pivoted at either end, withal an assembly which speaks reliability.

These are but two of the several unique points in the advance design of our instruments. Investigate our gauges critically. You will be convinced that you can find the most appropriate instrument and the best value for your requirements among our several scientifically designed gasoline gauges. Send us a blue print of your tank. We can help you work out improvements in your gasoline gauge assembly.

Rochester Manufacturing Co., Inc.
Office and factory,
Brighton Sta., Rochester, N. Y.
Western Sales:
2113 Dime Bank Bldg., Detroit, Mich.
Branches:
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719 Jefferson Ave., Toledo, Ohio.

Annular Ball Bearings
Reground or Exchanged

All Makes Rebuilt, Reground and fitted with special New Balls making them as good as new bearings

PRUYN
Ball Bearing Works

Main Office and Factory
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(PHILADELPHIA)
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Quaker Tires

T.T.T.
Reg. U. S.
Pat. Off.

Made by
Quaker City Rubber Co. Philadelphia

"MILES CHEAPER"

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SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS (*S. A. E. Standard*)

LIGHT SERIES

B'g. No.	Bore				Diameter				Width				Corners of the Outer Race and at Bore of* Inner Race		Eccentricity Tolerance in Inches	
	M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches (for both races)		M.M.	Inches	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus				
200	10	0.39370	0.0002	0.0004	30	1.18110	0	0.0006	9	0.35433	0	0.002	1	0.04	0.0008	0.0012
201	12	0.47244	0.0002	0.0004	32	1.25984	0	0.0006	10	0.39370	0	0.002	1	0.04	0.0008	0.0012
202	15	0.59055	0.0002	0.0004	35	1.37795	0	0.0006	11	0.43307	0	0.002	1	0.04	0.0008	0.0012
203	17	0.66929	0.0002	0.0004	40	1.57481	0	0.0006	12	0.47244	0	0.002	1	0.04	0.0008	0.0012
204	20	0.78740	0.0002	0.0004	47	1.85040	0	0.0006	14	0.55118	0	0.002	1	0.04	0.0008	0.0012
205	25	0.98425	0.0002	0.0006	52	2.04725	0	0.0008	15	0.59055	0	0.002	1	0.04	0.0008	0.0012
206	30	1.18110	0.0002	0.0006	62	2.44095	0	0.0008	16	0.62992	0	0.002	1	0.04	0.0008	0.0012
207	35	1.37795	0.0002	0.0006	72	2.83465	0	0.0008	17	0.66929	0	0.002	1	0.04	0.0008	0.0012
208	40	1.57481	0.0002	0.0006	80	3.14962	0	0.0008	18	0.70866	0	0.002	2	0.08	0.0008	0.0012
209	45	1.77166	0.0002	0.0006	85	3.34647	0	0.0008	19	0.74803	0	0.002	2	0.08	0.0010	0.0016
210	50	1.96851	0.0002	0.0006	90	3.54332	0	0.0008	20	0.78740	0	0.002	2	0.08	0.0010	0.0016
211	55	2.16536	0.0002	0.0006	100	3.93702	0	0.0008	21	0.82677	0	0.002	2	0.08	0.0010	0.0016
212	60	2.36221	0.0002	0.0006	110	4.33072	0	0.0008	22	0.86614	0	0.002	2	0.08	0.0010	0.0016
213	65	2.55906	0.0002	0.0006	120	4.72443	0	0.0008	23	0.90551	0	0.002	2	0.08	0.0010	0.0016
214	70	2.75591	0.0002	0.0006	125	4.92128	0	0.0008	24	0.94488	0	0.002	2	0.08	0.0010	0.0016
215	75	2.95277	0.0002	0.0006	130	5.11813	0	0.0008	25	0.98425	0	0.002	2	0.08	0.0010	0.0016
216	80	3.14962	0.0002	0.0006	140	5.51183	0	0.0008	26	1.02362	0	0.002	3	0.12	0.0012	0.0018
217	85	3.34647	0.0002	0.0007	150	5.90554	0	0.0012	28	1.10236	0	0.002	3	0.12	0.0012	0.0018
218	90	3.54332	0.0002	0.0007	160	6.29924	0	0.0012	30	1.18110	0	0.002	3	0.12	0.0012	0.0018
219	95	3.74017	0.0002	0.0007	170	6.69294	0	0.0012	32	1.25984	0	0.002	3	0.12	0.0012	0.0018
220	100	3.93702	0.0002	0.0007	180	7.08664	0	0.0012	34	1.33858	0	0.002	3	0.12	0.0012	0.0018
221	105	4.13387	0.0002	0.0007	190	7.48035	0	0.0012	36	1.41732	0	0.002	3	0.12	0.0012	0.0018
222	110	4.33072	0.0002	0.0007	200	7.87405	0	0.0012	38	1.49607	0	0.002	3	0.12	0.0012	0.0018

*A chamfer of 45 degrees ground true with the bore and outside diameter, is recommended.

(*Continued on page* 842)

Index to Tables and Data appears on Pages 41 to 44.

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SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS (*S. A. E. Standard*)

MEDIUM SERIES

B'g. No.	Bore				Diameter				Width				Corners of the Outer Race and at Bore of* Inner Race		Eccentricity Tolerance in Inches	
	M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches (for both races)		M.M.	Inches	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus				
300	10	0.39370	0.0002	0.0004	35	1.37795	0	0.0006	11	0.43307	0	0.002	1	0.04	0.0008	0.0012
301	12	0.47244	0.0002	0.0004	37	1.45669	0	0.0006	12	0.47244	0	0.002	1	0.04	0.0008	0.0012
302	15	0.59055	0.0002	0.0004	42	1.65355	0	0.0006	13	0.51181	0	0.002	1	0.04	0.0008	0.0012
303	17	0.66929	0.0002	0.0004	47	1.85040	0	0.0006	14	0.55118	0	0.002	1	0.04	0.0008	0.0012
304	20	0.78740	0.0002	0.0006	52	2.04725	0	0.0008	15	0.59055	0	0.002	1	0.04	0.0008	0.0012
305	25	0.98425	0.0002	0.0006	62	2.44095	0	0.0008	17	0.66929	0	0.002	1	0.04	0.0008	0.0012
306	30	1.18110	0.0002	0.0006	72	2.83465	0	0.0008	19	0.74803	0	0.002	2	0.08	0.0008	0.0012
307	35	1.37795	0.0002	0.0006	80	3.14962	0	0.0008	21	0.82677	0	0.002	2	0.08	0.0008	0.0012
308	40	1.57481	0.0002	0.0006	90	3.54332	0	0.0008	23	0.90551	0	0.002	2	0.08	0.0008	0.0012
309	45	1.77166	0.0002	0.0006	100	3.93702	0	0.0008	25	0.98425	0	0.002	2	0.08	0.0010	0.0016
310	50	1.96851	0.0002	0.0006	110	4.33072	0	0.0008	27	1.06299	0	0.002	2	0.08	0.0010	0.0016
311	55	2.16536	0.0002	0.0006	120	4.72443	0	0.0008	29	1.14173	0	0.002	2	0.08	0.0010	0.0016
312	60	2.36221	0.0002	0.0006	130	5.11813	0	0.0008	31	1.22047	0	0.002	2	0.08	0.0010	0.0016
313	65	2.55906	0.0002	0.0006	140	5.51183	0	0.0008	33	1.29921	0	0.002	3	0.12	0.0010	0.0016
314	70	2.75591	0.0002	0.0007	150	5.90554	0	0.0012	35	1.37795	0	0.002	3	0.12	0.0010	0.0016
315	75	2.95277	0.0002	0.0007	160	6.29924	0	0.0012	37	1.45669	0	0.002	3	0.12	0.0010	0.0016
316	80	3.14962	0.0002	0.0007	170	6.69294	0	0.0012	39	1.53544	0	0.002	3	0.12	0.0012	0.0018
317	85	3.34647	0.0002	0.0007	180	7.08664	0	0.0012	41	1.61418	0	0.002	3	0.12	0.0012	0.0018
318	90	3.54332	0.0002	0.0007	190	7.48035	0	0.0012	43	1.69292	0	0.002	3	0.12	0.0012	0.0018
319	95	3.74017	0.0002	0.0007	200	7.87405	0	0.0012	45	1.77166	0	0.002	3	0.12	0.0012	0.0018
320	100	3.93702	0.0002	0.0007	215	8.46460	0	0.0012	47	1.85040	0	0.002	3	0.12	0.0012	0.0018
321	105	4.13387	0.0002	0.0007	225	8.85830	0	0.0012	49	1.92914	0	0.002	3	0.12	0.0012	0.0018
322	110	4.33072	0.0002	0.0007	240	9.44886	0	0.0012	50	1.96851	0	0.002	3	0.12	0.0012	0.0018

*A chamfer of 45 degrees ground true with the bore and outside diameter, is recommended.

(*Continued on page* 844)

Index to Tables and Data appears on Pages 41 to 44.

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SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS (*S. A. E. Standard*)

HEAVY SERIES

B'g. No.	Bore				Diameter				Width				Corners of the Outer Race and at Bore of* Inner Race		Eccentricity Tolerance in Inches	
	M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches (for both races)		M.M.	Inches	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus				
403	17	0.66929	0.0002	0.0006	62	2.44095	0	0.0008	17	0.66929	0	0.002	1	0.04	0.0008	0.0012
404	20	0.78740	0.0002	0.0006	72	2.83465	0	0.0008	19	0.74803	0	0.002	2	0.08	0.0008	0.0012
405	25	0.98425	0.0002	0.0006	80	3.14962	0	0.0008	21	0.82677	0	0.002	2	0.08	0.0008	0.0012
406	30	1.18110	0.0002	0.0006	90	3.54332	0	0.0008	23	0.90551	0	0.002	2	0.08	0.0008	0.0012
407	35	1.37795	0.0002	0.0006	100	3.93702	0	0.0008	25	0.98425	0	0.002	2	0.08	0.0008	0.0012
408	40	1.57481	0.0002	0.0006	110	4.33072	0	0.0008	27	1.06299	0	0.002	2	0.08	0.0008	0.0012
409	45	1.77166	0.0002	0.0006	120	4.72443	0	0.0008	29	1.14173	0	0.002	2	0.08	0.0010	0.0016
410	50	1.96851	0.0002	0.0006	130	5.11813	0	0.0008	31	1.22047	0	0.002	2	0.08	0.0010	0.0016
411	55	2.16536	0.0002	0.0006	140	5.51183	0	0.0008	33	1.29921	0	0.002	3	0.12	0.0010	0.0016
412	60	2.36221	0.0002	0.0007	150	5.90554	0	0.0012	35	1.37795	0	0.002	3	0.12	0.0010	0.0016
413	65	2.55906	0.0002	0.0007	160	6.29924	0	0.0012	37	1.45669	0	0.002	3	0.12	0.0010	0.0016
414	70	2.75591	0.0002	0.0007	180	7.08664	0	0.0012	42	1.65355	0	0.002	3	0.12	0.0010	0.0016
415	75	2.95277	0.0002	0.0007	190	7.48035	0	0.0012	45	1.77166	0	0.002	3	0.12	0.0010	0.0016
416	80	3.14962	0.0002	0.0007	200	7.87405	0	0.0012	48	1.88977	0	0.002	3	0.12	0.0012	0.0018
417	85	3.34647	0.0002	0.0007	210	8.26775	0	0.0012	52	2.04725	0	0.002	3	0.12	0.0012	0.0018
418	90	3.54332	0.0002	0.0007	225	8.85830	0	0.0012	54	2.12599	0	0.002	3	0.12	0.0012	0.0018
419	95	3.74017	0.0002	0.0007	250	9.84256	0	0.0012	55	2.16536	0	0.002	3	0.12	0.0012	0.0018
420	100	3.93702	0.0002	0.0007	265	10.43311	0	0.0012	60	2.36221	0	0.002	3	0.12	0.0012	0.0018

*A chamfer of 45 degrees ground true with the bore and outside diameter, is recommended

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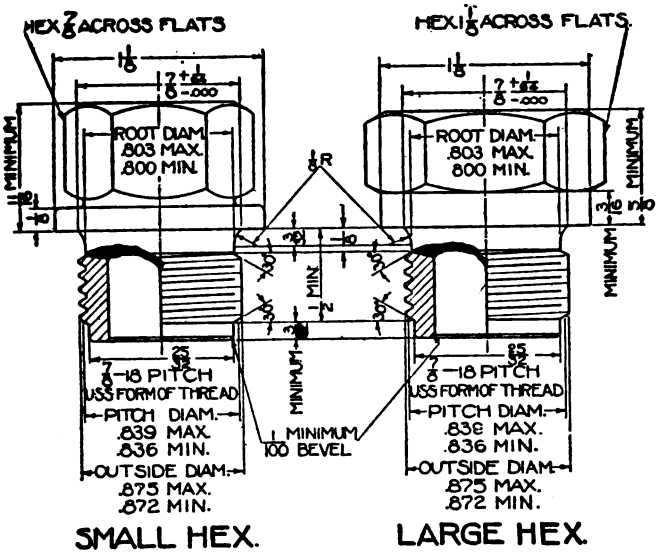
SPARK PLUG SHELL (*S. A. E. Standard*)



ALL DIMENSIONS BELOW SHOULDER ARE IDENTICAL FOR BOTH SPARK PLUG SHELLS

If spark plug taps are made to dimensions shown in the accompanying table, the plugs can be turned in by hand, using a wrench only for final tightening.

THREAD DATA

7/8—18 U. S. S. FORM OF THREAD

	Nominal Dimension	THREAD LIMITS	
		Spark Plug	Tap
Outside diameter.....	.875	.872 Min. .875 Max.	.877 Min. .879 Max.
Pitch diameter.....	.839	.836 Min. .839 Max.	.841 Min. .843 Max.
Root diameter.....	.803	.800 Min. .803 Max.	.805 Min. .807 Max.

Tap Drill Diameter
Nominal 13/16 = .8125
.810 Min. .813 Max.

All dimensions in inches.

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HEXAGON HEAD SCREWS, CASTLE AND PLAIN NUTS (*S. A. E. Standard*)

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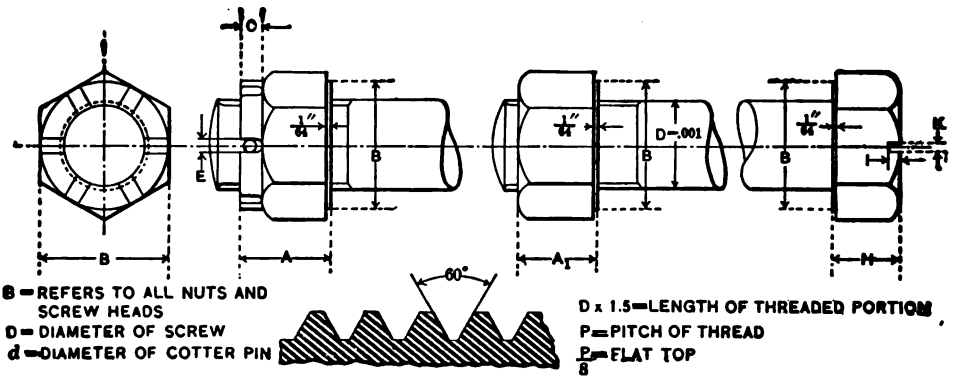
DIMENSIONS



D	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
P	28	24	24	20	20	18	18	16	16	14	14	12	12	12	12
A	9/32	21/64	13/32	29/64	9/16	39/64	23/32	49/64	13/16	29/32	1	1 5/32	1 1/4	1 13/32	1 1/2
A1	7/32	17/64	21/64	3/8	7/16	31/64	35/64	19/32	21/32	49/64	7/8	63/64	1 3/32	1 13/64	1 5/16
B	7/16	1/2	9/16	5/8	3/4	7/8	15/16	1	1 1/16	1 1/4	1 7/16	1 5/8	1 13/16	2	2 3/16
C	3/32	3/32	1/8	1/8	3/16	3/16	1/4	1/4	1/4	1/4	1/4	5/16	5/16	3/8	3/8
E	5/64	5/64	1/8	1/8	1/8	5/32	5/32	5/32	5/32	5/32	5/32	7/32	7/32	1/4	1/4
H	3/16	15/64	9/32	21/64	3/8	27/64	15/32	33/64	9/16	21/32	3/4	27/32	15/16	1 1/32	1 1/8
I	3/32	7/64	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	7/32	7/32	1/4	1/4
K	1/16	1/16	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32	5/32	5/32	3/16	3/16
d	1/16	1/16	3/32	3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8	11/64	11/64	13/64	13/64

Dimensions. All dimensions in inches.
Finish. All heads and nuts to be semi-finish.
Material. For all screws and nuts—steel.
Screws are to be left soft. Screw heads are to be left soft. The plain nuts are to be left soft. The Castle nuts are to be case-hardened.

(*Continued on page* 850)

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A Reminder

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1916

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Detroit, Michigan

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LARGE DIAMETER THREAD (*S. A. E. Standard*)

Diameter, Inches	Pitch		Diameter, Inches	Pitch	
	Coarse	Fine		Coarse	Fine
1⅝	12	16	3⅞	10	16
1¾	12	16	4	10	16
1⅞	12	16	4⅛	10	16
2	12	16	4¼	10	16
2⅛	12	16	4⅜	10	16
2¼	12	16	4½	10	16
2⅜	12	16	4⅝	10	16
2½	12	16	4¾	10	16
2⅝	12	16	4⅞	10	16
2¾	12	16	5	10	16
2⅞	12	16	5⅛	10	16
3	10	16	5¼	10	16
3⅛	10	16	5⅜	10	16
3¼	10	16	5½	10	16
3⅜	10	16	5⅝	10	16
3½	10	16	5¾	10	16
3⅝	10	16	5⅞	10	16
3¾	10	16	6 & over	8	16

All threads to be U. S. S. form.

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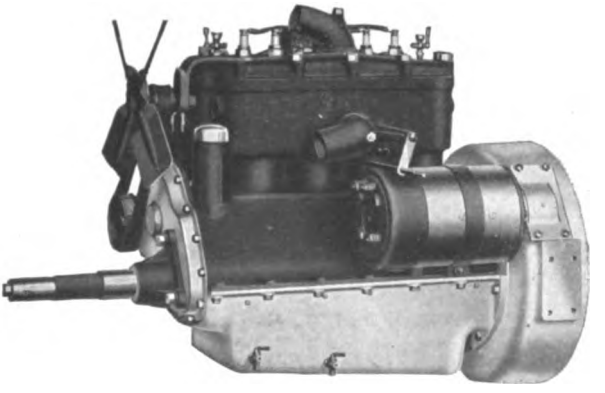

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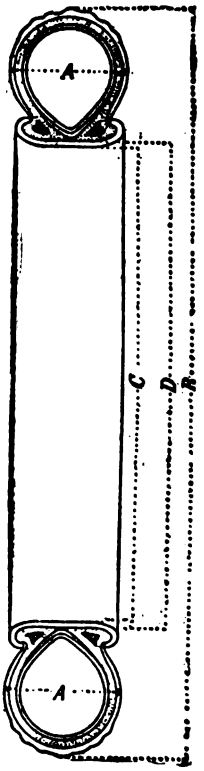
CLINCHER TIRE AND RIM DIMENSIONS



A	B	C	D
Inches	Inches	Inches	Inches
2 ½	26	20 ¾	21
3	26	19 ¾	20
2 ½ and 3	28	21 ¾	22
2 ½ and 3	30	23 ¾	24
3	32	25 ¾	26
3	34	27 ¾	28
3	36	29 ¾	30
3 ½	28	20 11/16	21
3 ½	30	22 11/16	23
3 ½	32	24 11/16	25
3 ½	34	26 11/16	27
3 ½	36	28 11/16	29
4	30	21 11/16	22
4	32	23 11/16	24
4	34	25 11/16	26
4	36	27 11/16	28
4 ½	32	22 11/16	23
4 ½	34	24 11/16	25
4 ½	36	26 11/16	27

PROPORTIONS BETWEEN AXLE LOADS AND TIRE SIZES ADOPTED BY AMERICAN TIRE MAKERS

2 ½-inch tires, all diameters	225	pounds	per	wheel
3 inch tires, all diameters	350	"	"	"
3 ½ x 28-inch tires	400	"	"	"
3 ½ x 30-inch tires	450	"	"	"
3 ½ x 32-inch tires	555	"	"	"
3 ½ x 34-inch tires	600	"	"	"
3 ½ x 36-inch tires	600	"	"	"
4 x 30-inch tires	550	"	"	"
4 x 32-inch tires	650	"	"	"
4 x 34-inch tires	700	"	"	"
4 x 36-inch tires	750	"	"	"
4 ½ x 32-inch tires	700	"	"	"
4 ½ x 34-inch tires	800	"	"	"
4 ½ x 36-inch tires	900	"	"	"

For weights in excess of 1,000 pounds per wheel, 5-inch tires and over are recommended. Weights given apply to car without passengers.

Index to Tables and Data appears on Pages 41 to 44.

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FELT SPECIALISTS

It doesn't matter what the job calls for

Cutting—Punching or Stripping

We have the best equipped factory in existence to do the work promptly and satisfactorily.

Whether you are, or are not, satisfied with present service it will pay you to investigate

ADVANCE
QUALITY + SERVICE

We specialize in the manufacture of Felt Washers and Gaskets for Ford and Overland cars. Ask for free sample of Assortment No. 1, containing a complete set of 23 washers and gaskets for Ford cars.

Advance Felt Specialty & Cutting Co.
159 W. Harrison St. Chicago

"LUXURY" Auxiliary Seats

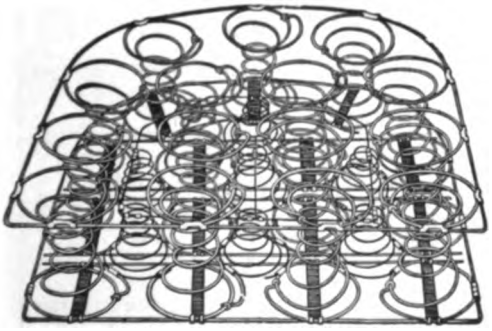
The leading revolving folding seats for automobiles.

Style "A" PATENTED.

These seats are fully covered by patents, and are the most luxurious revolving auxiliary seats ever made. Instantly detachable. No disfiguring parts left in the car. Made in 5 styles. Fully padded and skeleton backs. In any color leather to match sample. Dovetail socket holds seat bracket.

Get our special prices to manufacturers and dealers. We guarantee prompt deliveries on quantity orders. New Catalog just out.

HODGE & GRAVES CO.
AMESBURY, MASS.



ROUGH RIDER SPRINGS (Patented)

Best Automobile Spring Ever Made

No Possible Bumps or Jars — See these Auxiliary Springs?

The Best Cushions are Made with

ROUGH RIDER SPRINGS

NOTHING SO COMFORTABLE

No Shocks or Jars when Rough Riders are used

Manufactured by

JACKSON CUSHION SPRING CO., Jackson, Mich.
RANDOLPH EDWARDS CO. Exclusive Selling Agents

HOWE RUBBER COMPANY

New Brunswick, New Jersey

Chicago BRANCHES Atlanta
San Francisco New York City Los Angeles

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APPROXIMATE WOOD WHEEL DIAMETERS FOR VARIOUS SIZES AND TYPES OF RIMS

Size Tire	Clincher Universal and Stanweld Detachable	Firestone Demountable	Fisk Bolted On	Fisk Demountable	Stanweld Demountable	Stanweld Demountable Metric Sizes
30 × 3½	22 11/16	21 11/16	21 13/16	19 3/16	22	.....
32 × 3½	24 11/16	23 11/16	23 13/16	21 3/16	24	810 × 90 – 23 3/16
34 × 3½	26 11/16	25 11/16	25 13/16	23 3/16	26	870 × 90 – 25 5/8
36 × 3½	28 11/16	27 11/16	27 13/16	.....	28	910 × 90 – 27 3/16
30 × 4	21 11/16	20 11/16	20 5/8	.....	21	.....
32 × 4	23 11/16	22 11/16	22 5/8	20	23	.....
34 × 4	25 11/16	24 11/16	24 5/8	22	25	875 × 105 – 25 5/8
36 × 4	27 11/16	26 11/16	26 5/8	24	27	915 × 105 – 27 3/16
32 × 4½	22 21/32	21 21/32	21½	.....	.....	820 × 120 – 21 17/64
34 × 4½	24 21/32	23 21/32	23½	20 13/16	23 59/64	880 × 120 – 23 47/64
36 × 4½	26 21/32	25 21/32	25½	22 13/16	25 59/64	920 × 120 – 25 3/16
34 × 5	23 21/32	22 21/32	.....	19 13/16	22 59/64	.....
36 × 5	25 21/32	24 21/32	.....	21 13/16	24 59/64	.....
36 × 5½	24 21/32	23 21/32	.....	.....	.....	935 × 135 – 24 3/64
37 × 5½	25 21/32	24 21/32	.....	.....	24 3/64	.....

NON-FERROUS METAL TUBING TOLERANCES

Tubing can be furnished in copper, and the commercial alloys of copper and zinc, such as high brass, bronze, phosphor bronze, and tobin bronze.

Composition.—As specified to meet the requirements of use.

Temper.—As specified in the order; may be hard, half hard or annealed. If annealed, the tubing may be soft, or light annealed.

Size variation.—On inside and outside diameter and the thickness of the walls, as follows:

Outside and Inside Dimensions

Up to ½ in. inclusive	0.002 in. over or under
Over ½ in. to and including ¾ in	0.0025 in. over or under
Over ¾ in. to and including 1 in	0.003 in. over or under
Over 1 in. to and including 1¼ in	0.0035 in. over or under
Over 1¼ in. to and including 1½ in	0.004 in. over or under
Over 1½ in. to and including 1¾ in	0.0045 in. over or under
Over 1¾ in. to and including 2 in	0.005 in. over or under
Over 2 in	¼ of 1 per cent. over or under

No combination of variations on the same tube shall make the thickness of the wall vary from the nominal by more than the following amounts:

Thickness of Wall

Up to and including 1/64 in	0.001 in. over or under
Over 1/64 in. to and including 1/32 in	0.002 in. over or under
Over 1/32 in. to and including 1/16 in	0.003 in. over or under
Over 1/16 in. to and including ⅛ in	0.005 in. over or under
Over ⅛ in. to and including ¼ in	0.008 in. over or under
Over ¼ in. to and including 5/16 in	0.0125 in. over or under
Over 5/16 in. to and including ⅜ in	0.015 in. over or under

Special limits.—On all stock where the above commercial variations are not permissible limits shall be specified in the order.

Index to Tables and Data appears on Pages 41 to 44.

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Automobile Wheels

For Truck and Pleasure Car

WAYNE WHEEL COMPANY
Newark, New York State

Automobile Springs

COME TO HEADQUARTERS FOR SPRINGS. WE CARRY IN STOCK AND SHIP SAME DAY ANY SPRING FOR ANY CAR. ***We can save you time and money.***

Triple Action springs are guaranteed crucible analysis steel and correct in every specification. Strengthened at points most subject to breakage. We manufacture Vanadium steel springs, too. Prices lowest for first quality and the fastest service in the business; all repairs, too.

Get our figures on springs. Order all replacements direct from us. Always give make of car, model, year made and state which springs or parts wanted. Send for 1916 spring catalog. Over 3,000 dealers order all springs for stock and replacements of us. Manufacturers of the Johnson Shock Absorber.

Triple Action Spring Co., *49 East 28th Street CHICAGO*

AUTO-SIGNAL "Twin"

R. & L. Instrument Company
BELOIT, WIS.

Manufacturers of Traffic Signals
Front and Rear Electrically Operated
AUTO-SIGNALS
Twin model (see cut) consists of a Right, Left and Slow Down or Stop Signal, Tail Light and License Bracket.
Further details on request.

Jobbers—ATTENTION—Dealers
AGENTS WANTED

M. I. McAvoy Co., Racine, Wis.

Makers of

QUALITY SEAT COVERS

for Automobiles

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AUTOMOBILE WHEEL DATA

The following information is approximately correct, but the weights, etc., may vary according to the height of wheels, etc.:

WEIGHT OF WHEELS PER SET OF FOUR

Weight of wheels and hubs without rims or channels, size of spoke ⅞ to 1″ or 1⅛″, about	50	pounds
" same size with steel rims for 2½″ or 3″ tire	110	"
" 1″ or 1⅛″ spokes	65	"
" including rims for 3″ or 3½″ tires	145	"
" 1¼″ or 1⅜″ spokes	100	"
" including rims for 3½″ or 4″ tires	210	"
" 1⅜″ or 1½″ spokes	112	"
" including rims for 4″ or 4½″ tire	250	"

Axles are not included in above.

METRIC TIRES AND THEIR AMERICAN EQUIVALENTS

Metric Sizes	Approximate Size in Inches
650 x 65	26 x 2½
700 x 65	28 x 2½
750 x 65	30 x 2½
800 x 65	32 x 2½
830 x 65	33 x 2½
860 x 65	34 x 2½
700 x 85	28 x 3¼
750 x 85	30 x 3¼
800 x 85	32 x 3¼
860 x 85	34 x 3¼
760 x 90	30 x 3½
810 x 90	32 x 3½
840 x 90	32 x 3½
870 x 90	34 x 3½
910 x 90	36 x 3½
960 x 90	38 x 3½
1010 x 90	40 x 3½
815 x 105	32 x 4
875 x 105	34 x 4
915 x 105	36 x 4
820 x 120	32 x 4½–5
850 x 120	33 x 4½–5
880 x 120	34 x 4½–5
920 x 120	36 x 4½–5
1020 x 120	40 x 4½–5
1080 x 120	42 x 4½–5

Index to Tables and Data appears on Pages 41 to 44.

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You take no chances with PERFECTION POLISH

Put it in stock and see how fast it will more. A life saver for varnish which is absolutely safe for the inexperienced car owner to use. Preserves and renews the lustre of automobile bodies.

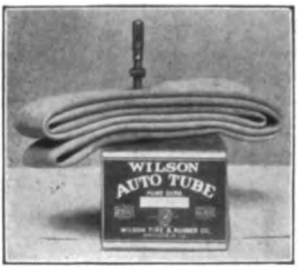
Retails in 4 oz. bottles at 25 cents and 10 oz. bottles for 50 cents. Liberal discounts and special inducements to dealers. Advertising matter furnished the trade to boost sales.

PERFECTION POLISH CO.
WAVERLY, N. Y.

—NEWTYPE—
THE ORIGINAL
SPOT LIGHT

4" Size, complete, $3.00. (Cat. No. 115.)
6" Size, complete, $6.00. (Cat. No. 102.)
6" Size, complete (with diminishing mirror "built in" lamp), $7.00. (Cat. No. 102M.)
8" Size, complete, $9.00. (Cat. No. 101.)
8" Size, complete (with diminishing mirror "built in" lamp, and exclusive NEWTYPE feature). (Cat. No. 101M.)
Dealers: Write for our proposition, it will interest *you*.

Address:
The Wood Manufacturing Co.
Dept. M. FAIRFIELD, CONN.

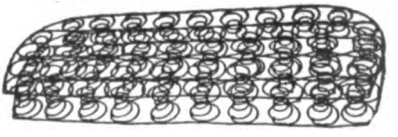


WILSON
Auto Tires and Tubes
We challenge the
WORLD
QUALITY and PRICE
Considered
Lowest COST Per Mile

Wilson Tire & Rubber Co.
Springfield
ILLINOIS

THE WING PATTERN
CUSHION SPRING

shown below is used by all the leading manufacturers of Automobiles in the East and has stood the test of ten years' service with satisfaction alike to makers of Cars as well as users.



Cushion Spring (Wing Pattern) for Auto Seats
Manufactured by
THE CHARLES WING CO
Amesbury, Mass., U. S. A.

Manufacturers of Auto Top Strap and Straps and Trimmings of many varieties, also wholesale dealers in all classes of Automobile Upholstering Leather and other materials.

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CHEMICAL COMPOSITION AND PHYSICAL PROPERTIES OF VARIOUS SUBSTANCES THAT HAVE A HEAT VALUE

Fuel	Chemical Proportions	Weight of Gas at 30°, per Cubic Foot	Volume of 1 Pound of Gas at Atmospheric Pressure		Volume Required to Burn 1 Cubic Foot of Gas		Weight Required to Burn 1 Pound of Gas		Specific Heat of Gas at Constant Pressure	Heat of Combustion	
		Pound	Cubic Feet		Cubic Feet		Pounds			B.T.U. per Pound of Fuel	B.T.U. per Cubic Foot of Gas at 62°
			32°	62°	O	Air	O	Air			
Oxygen, O	23 lb. O+77 lb. N=100 lb. air	.08927	11.20	11.88	...	.....	....	.....	.21751	.....	.....
Nitrogen, N	21 vol. O+79 vol. N=100 vol. air	.07847	12.77	13.55	...	.....	....	.....	.24380	.....	.....
Hyrdogen, H	$2H+O=H_2O$	.00562	178.80	189.80	.5	2.38	8.00	34.80	3.40900	62,000	327
Carbon, C	$C+O=CO$	.....	.....	.....	...	.....	....	.....	.....	4,400	.....
Carbon, C	$C+2O=CO_2$	.....	.....	.....	...	.....	....	.....	.....	14,600	.....
Carbon monoxide, CO	$CO+O=CO_2$	.07704	12.77	13.55	.5	2.38	.57	2.48	.24790	.....	324
Carbon dioxide, CO_2	1 lb. C+2.66 lb. O=3.66 lb. CO_2	.12323	8.12	8.60	...	.....	....	.....	.21700	4,385	.....
Methane (marsh gas), CH_4	$CH_4+4O=2H_2O+CO_2$	.04538	22.37	23.73	2.0	9.52	4.00	17.40	.59290	23,976	1,010
Ethylene (olefiant gas), C_2H_4	$C_2H_4+6O=2H_2O+2CO_2$	.07830	12.77	13.55	3.0	14.28	3.43	14.90	.40400	21,476	1,585
Ethane, C_2H_6	$C_2H_6+7O=3H_2O+2CO_2$	.08369	11.94	12.67	3.5	16.66	....	.....	.....	22,356	1,765
Benzol vapors, C_6H_6	$C_6H_6+15O=3H_2O+6CO_2$	.22363	4.47	4.74	7.5	35.7	....	.....	.37540	18,183	3,836
Acetylene, C_2H_2	$C_2H_2+5O=H_2O+2CO_2$	.07251	13.79	14.63	2.5	11.9	....	.....	.....	21,421	1,464

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Bay City Foundry & Machine Co.

BAY CITY, MICH.

Specializing Gray Iron and Brass Castings for Automobile and Gas Engines

PROMPT DELIVERIES

Patents Trade Marks Designs

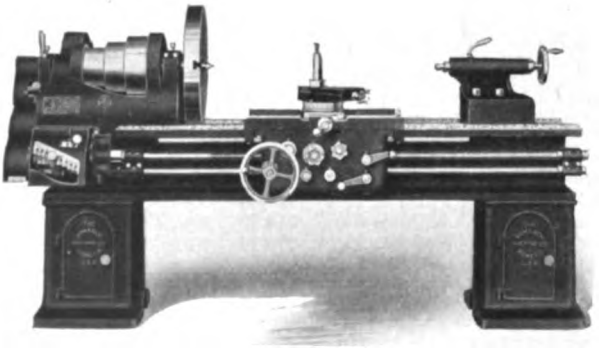
My long and successful experience in the Design and Construction of Motor Cars and their Accessories enables me to properly advise inventors regarding the procuring of Letters Patent.

Correspondence solicited from all inventors, strictly confidential.

MALCOLM F. GANNETT, Registered Patent Attorney

1212 "C" Street, N. E. WASHINGTON, D. C.

"Have you Registered Your Trade Mark?" If not, you should do so. Complete information on request.



MONARCH LATHES are built for the Automobile factory and allied industries in the following sizes: 14, 16, 18 and 20-inch Manufacturing lathes. The same sizes are also furnished with all necessary attachments for the finest tool room work.

These sizes are also furnished in heavy duty stud and turret lathes.

Monarch lathes are sold at moderate prices by a leading machinery dealer in practically every commercial center.

Send for catalog No. 12.

The Monarch Machine Tool Co.

SIDNEY, OHIO

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MOLECULAR WEIGHT OF PETROLEUM DISTILLATES

The atomic weight of the elements entering into the fractions may be set down thus:

Hydrogen	1
Carbon	12
Oxygen	16

The molecular weight may be found as follows:

(*a*) butane, $C_4H_{10} = 4 \times 12 + 10 \times 1 = 58$;
(*b*) pentane, $C_5H_{12} = 5 \times 12 + 12 \times 1 = 72$;
(*c*) hexane, $C_6H_{14} = 6 \times 12 + 14 \times 1 = 86$;
(*d*) heptane, $C_7H_{16} = 7 \times 12 + 16 \times 1 = 100$;
(*e*) octane, $C_8H_{18} = 8 \times 12 + 18 \times 1 = 114$;
(*f*) nonane, $C_9H_{20} = 9 \times 12 + 20 \times 1 = 128$;
(*g*) decane, $C_{10}H_{22} = 10 \times 12 + 22 \times 1 = 142$.

In like manner the molecular weight of any of the compounds may be found, the rule for which may be stated as follows:

Multiply the atomic weight of each element by the number of atoms for each element and the sum of the respective products will be the molecular weight of the resultant compound.

In general practice it has been the custom to consider that gasoline was largely hexane, the molecular weight of which was taken in the further determinations. It is highly improbable that this method will serve, for the reason that hexane is not now used to the same extent as formerly and the chances are that heptane and octane will have to be taken into account.

TABLE OF APPROXIMATE CAPACITIES IN LIQUID GALLONS FOR CIRCULAR TANKS

1	2	3	4	5	6	7	8	9	10	Gallons	Gal'ns per Inch
5x12	6x18	6x24	6x36	6x42						6″ diam'r	.122
	7x12	7x18	7x24	7x30	7x36	7x42	7x48			7″ "	.165
		8x15	8x18	8x24	8x30	8x36	8x42	8x45	8x48	8″ "	.217
		9x12	9x15	9x18	9x24	9x30	9x34	9x36	9x40	9″ "	.275
					10x20	10x24	10x26	10x28	10x32	10″ "	.340
						12x16	12x18	12x20	12x24	12″ "	.486

10	15	20	25	30	35	40	45	50	Gallons	Gal'ns per Inch
8x48									8″ diam'r	.217
9x40									9″ "	.275
10x32	10x48								10″ "	.340
12x24	12x34	12x42	12x50	12x60					12″ "	.486
14x18	14x24	14x30	14x38	14x44	14x52	14x60			14″ "	.666
	16x18	16x24	16x30	16x36	16x42	16x48	16x54	16x60	16″ "	.870

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HOLMES WRECKING TRUCK

When you bring in a wrecked car you need this truck. In a moment you raise the car with this lever, then strap the tongue in place, and away you go. Hundreds of garages are now equipped, and the way they bring in their customers is a great surprise. One truck for front or rear. Let us send you our literature. You need it. Liberal discounts.

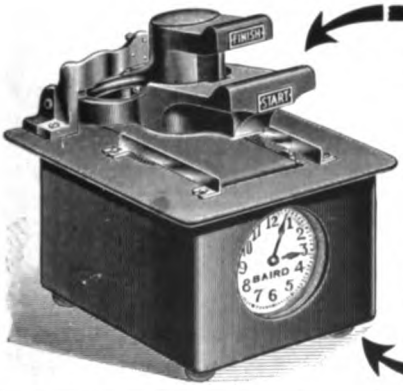
ROBERT HOLMES & BROS. DANVILLE, ILLINOIS

McNaull Tires

8000 MILES

The McNaull Tire Co.

Toledo, Ohio



Baird Automatic Time Stamps

Tell exactly where you stand—how much time you spend on a job—how much to charge for it—when cars enter and leave your garage—when your help arrive and depart—when your mail gets to you.

Baird Time Stamps do more to maintain a strict discipline in your organization than any means you can adopt. Write for complete description and price lists.

BAIRD EQUIPMENT CO.
325 W. Ohio St., Chicago

Make Your FORD Do Double Duty

SAVES THE COST OF A NEW CAR

Here's the greatest money-saving, money-making invention of the age for Ford cars. Enables you to change your pleasure body to a commercial body or vice versa in 10 minutes. Makes one Ford car do multiple duty as both pleasure car and commercial car. A big seller because it saves the cost and upkeep of an extra car for farmers, grocers, butchers and all retail merchants.

THE ECONOMY BODY LOCK

dispenses with all bolts and nuts that lock the body to the frame. Locks any body on rigidly and securely, yet releases it in an instant. One man can interchange the bodies in a few moments' time with our **Economy cradle.**

Dealers: Write at once for full particulars and terms.

ECONOMY BODY LOCK & CRADLE CO.
812 Hartford Bldg. Chicago, Ill.

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CAPACITY OF ATMOSPHERIC AIR FOR WATER VAPOR AT DIFFERENT TEMPERATURES

Temperature in Degrees Fahrenheit	Pounds per Cubic Feet Dry Air	Pounds of Vapor in One Pound of Air	Weight in Pounds, Cubic Feet Saturated Air	Vapor in Air	A | V
32	0.0807	0.00379	0.0802	0.000304	263.7
42	0.0791	0.00561	0.0784	0.000440	178.18
52	0.0776	0.00819	0.0766	0.000627	122.
62	0.0761	0.01179	0.0747	0.000881	85.
72	0.0747	0.01680	0.0727	0.001221	59.5
82	0.0733	0.02361	0.0706	0.001667	42.3
92	0.0720	0.03289	0.0684	0 002250	30.3
102	0.0707	0.04547	0.0659	0.002997	22.

VARIATION OF VOLUME AND TEMPERATURE WITH COMPRESSION

Gauge Pressure	Volume	Temperature
0	1.000	60
2	.910	80.4
5	.810	106
10	.690	145
20	.543	207
30	.454	252
40	.393	302
50	.350	339
75	.276	420
100	.232	485
115	.213	518
130	.197	550
145	.184	580
160	.172	607
175	.163	632
200	.149	672

The foregoing table is based on the assumption that no heat is added or subtracted.

VISCOSITY OF GASOLINE

In considering the functioning of the gasoline carbureter, changes in viscosity of the fuel due to differences in temperature should be considered. It is a mistake to assume that because gasoline does not noticeably thicken up at the lower atmospheric temperatures (usual in the Northern States in winter) it will flow through the nozzle of a carbureter at the same rate under all heat conditions. Taking gasoline of a specific gravity of 0.71, it has been shown by experiment that the amount which will pass through a nozzle of a carbureter under a given pressure will increase as the temperature is increased in the following manner:

Temperature in ° F.	50	59	68	77	86	95
Relative flow	1	1.073	1.145	1.212	1.27	1.335

Since nozzles in carbureters are not readily adjustable, and with any degree of certainty, it follows that such a great difference in the weight of fuel ejected, considering the differences in temperature named, is bound to lead to a certain amount of carbureter inefficiency of the kind which does not readily yield to treatment.

Index to Tables and Data appears on Pages 41 to 44.

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UNION TIRES *Guaranteed* 6,000 MILES

DISTRIBUTED BY

UNION SALES CO., Inc.

HARRISBURG, PENNA.

Hartford Auto Parts Co.

Hartford, Conn.

UNIVERSAL JOINTS AND CONE CLUTCHES

BATTERY EXCHANGE

Permalite

LASTS FOREVER!

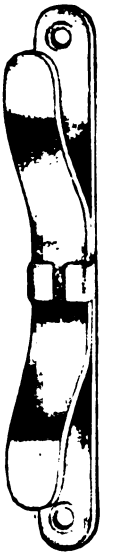
A new idea in starting and lighting battery service. It is not sold, but leased for a nominal sum, and exchanged at will, for a small fee. It assures top-notch service, freedom from battery troubles and expense, and the necessity of replacing batteries at heavy cost.

—Write for the details of our permanent battery service and dealer plan—

"Why Buy a Battery?"

Union Motor Device Co.

Meridian & 10th Indianapolis, Ind.



The Anti-Rattler for AUTO DOORS

A quick quieter for doors that rattle—as they do on eight out of every ten cars. A simple little device to fasten to the door jamb with two screws—on in a minute and on the job for keeps! Nearly every motorist who passes your store has at least one rattling door on his car. When he sees he can stop that rattle with 25c and a screw-driver—in he comes and buys. Maybe he buys the screw-driver too! Every sale leaves a neat profit, too.

Sells for a quarter a pair. One dozen pairs on a Sales Compelling Show Card.

Send for discounts.

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North East, Pa.

Manufacturers of the

FERNALD QUICK-HITCH OR TRAILER COUPLING

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TABLE FOR THE DIVISION OF THE CIRCUMFERENCE

Number of Divisions in the Circumference	Angle of Corresponding Division of Circle; Degrees	Length of Chord in Decimal Fraction of Radius	Number of Divisions in the Circumference	Angle of Corresponding Division of Circle; Degrees	Length of Chord in Decimal Fraction of Radius
3	120	1.73206	52	6.55	0.120356
4	90	1.41422	53	6.47	0.118032
5	72	1.17558	54	6.40	0.11629
6	60	1	55	6.32	0.113966
7	51.25	0.86732	56	6.25	0.111644
8	45	0.76536	57	6.18	0.1099
9	40	0.68404	58	6.12	0.108158
10	36	0.61804	59	6.06	0.106414
11	32.43	0.563	60	6	0.104672
12	30	0.51764	61	5.54	0.102928
13	27	0.4782	62	5.48	0.101186
14	25	0.4448	63	5.42	0.099442
15	24	0.41582	64	5.37	0.0977
16	22.30	0.39018	65	5.32	0.096538
17	21.10	0.36734	66	5.27	0.094794
18	20	0.3473	67	5.22	0.093632
19	18.56	0.32894	68	5.17	0.091888
20	18	0.31286	69	5.13	0.090765
21	17.08	0.29792	70	5.08	0.089564
22	16.21	0.2841	71	5.04	0.088402
23	15.39	0.272	72	5	0.087238
24	15	0.26106	73	4.55	0.085496
25	14.24	0.25066	74	4.51	0.084332
26	13.50	0.24086	75	4.48	0.083752
27	13.20	0.23218	76	4.44	0.083588
28	12.51	0.22352	77	4.40	0.081426
29	12.24	0.216	78	4.36	0.080264
30	12	0.20906	79	4.33	0.0791
31	11.36	0.20212	80	4.30	0.078518
32	11.15	0.19574	81	4.26	0.077356
33	10.54	0.18996	82	4.23	0.076194
34	10.35	0.18416	83	4.20	0.075612
35	10.17	0.17894	84	4.17	0.07445
36	10	0.17432	85	4.14	0.073868
37	9.43	0.1691	86	4.11	0.072706
38	9.28	0.16504	87	4.08	0.072124
39	9.13	0.1604	88	4.05	0.070962
40	9	0.15692	89	4.02	0.07038
41	8.46	0.15286	90	4.	0.069798
42	8.34	0.14938	91	3.57	0.0686362
43	8.22	0.1459	92	3.54	0.0680546
44	8.10	0.14242	93	3.52	0.0674732
45	8	0.13952	94	3.49	0.0663104
46	7.49	0.13603	95	3.47	0.0657288
47	7.39	0.133128	96	3.45	0.0651474
48	7.30	0.130806	97	3.42	0.064566
49	7.20	0.127904	98	3.40	0.0639844
50	7.12	0.125582	99	3.38	0.63403
51	7.03	0.122678	100	3.36	0.0628216

This table should be useful for gear and chain wheel calculation and design

Index to Tables and Data appears on Pages 41 to 44.

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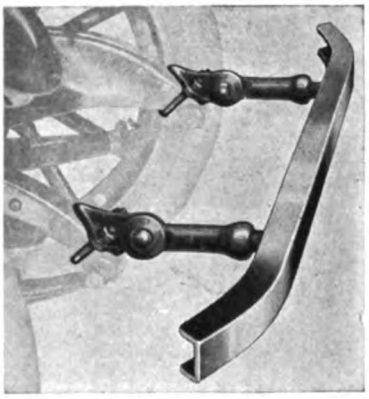
Big Demand—
Big Profit—



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CIRCUMFERENCES AND AREAS OF CIRCLES

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Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
1/64	.04909	.00019	2 3/8	7.4613	4.4301	6 1/8	19.242	29.465
1/32	.09818	.00077	7/16	7.6576	4.6664	1/4	19.635	30.680
3/64	.14726	.00173	1/2	7.8540	4.9087	3/8	20.028	31.919
1/16	.19635	.00307	9/16	8.0503	5.1572	1/2	20.420	33.183
3/32	.29452	.00690	5/8	8.2467	5.4119	5/8	20.813	34.472
1/8	.39270	.01227	11/16	8.4430	5.6727	3/4	21.206	35.785
5/32	.49087	.01917	3/4	8.6394	5.9396	7/8	21.598	37.122
3/16	.58905	.02761	13/16	8.8357	6.2126	7	21.991	38.485
7/32	.68722	.03758	7/8	9.0321	6.4918	1/8	22.384	39.871
			15/16	9.2284	6.7771	1/4	22.776	41.282
1/4	.78540	.04909				3/8	23.169	42.718
9/32	.88357	.06213	3	9.4284	7.0686	1/2	23.562	44.179
5/16	.98175	.07670	1/16	9.6211	7.3662	5/8	23.955	45.664
11/32	1.0799	.09281	1/8	9.8175	7.6699	3/4	24.347	47.173
3/8	1.1781	.11045	3/16	10.014	7.9798	7/8	24.740	48.707
13/32	1.2763	.12962	1/4	10.210	8.2958	8	25.133	50.265
7/16	1.3744	.15033	5/16	10.407	8.6179	1/8	25.525	51.849
15/32	1.4726	.17257	3/8	10.603	8.9462	1/4	25.918	53.456
			7/16	10.799	9.2806	3/8	26.311	55.088
1/2	1.5708	.19635	1/2	10.996	9.6211	1/2	26.704	56.745
17/32	1.6690	.22166	9/16	11.192	9.9678	5/8	27.096	58.426
9/16	1.7671	.24850	5/8	11.388	10.321	3/4	27.489	60.132
19/32	1.8653	.27688	11/16	11.585	10.680	7/8	27.882	61.862
5/8	1.9635	.30680	3/4	11.781	11.045	9	28.274	63.617
21/32	2.0617	.33824	13/16	11.977	11.416	1/8	28.667	65.397
11/16	2.1598	.37122	7/8	12.174	11.793	1/4	29.060	67.201
23/32	2.2580	.40574	15/16	12.370	12.177	3/8	29.452	69.029
			4	12.566	12.566	1/2	29.845	70.882
3/4	2.3562	.44179	1/16	12.763	12.962	5/8	30.238	72.760
25/32	2.4544	.47937	1/8	12.959	13.364	3/4	30.631	74.662
13/16	2.5525	.51849	3/16	13.155	13.772	7/8	31.023	76.589
27/32	2.6507	.55914	1/4	13.352	14.186	10	31.416	78.540
7/8	2.7489	.60132	5/16	13.548	14.607	1/8	31.809	80.516
29/32	2.8471	.64504	3/8	13.744	15.033	1/4	32.201	82.516
15/16	2.9452	.69029	7/16	13.941	15.466	3/8	32.594	84.541
31/32	3.0434	.73708	1/2	14.137	15.904	1/2	32.987	86.590
			9/16	14.334	16.349	5/8	33.379	88.664
1	3.1416	.7854	5/8	14.530	16.800	3/4	33.772	90.763
1/16	3.3379	.8866	11/16	14.726	17.257	7/8	34.165	92.886
1/8	3.5343	.9940	3/4	14.923	17.728	11	34.558	95.033
3/16	3.7306	1.1075	13/16	15.119	18.190	1/8	34.950	97.205
1/4	3.9270	1.2272	7/8	15.315	18.665	1/4	35.343	99.402
5/16	4.1233	1.3530	15/16	15.512	19.147	3/8	35.736	101.62
3/8	4.3197	1.4849	5	15.708	19.635	1/2	36.128	103.87
7/16	4.5160	1.6230	1/16	15.904	20.129	5/8	36.521	106.14
1/2	4.7124	1.7671	1/8	16.101	20.629	3/4	36.914	108.43
9/16	4.9087	1.9175	3/16	16.297	21.135	7/8	37.306	110.75
5/8	5.1051	2.0739	1/4	16.493	21.648	12	37.699	113.10
11/16	5.3014	2.2365	5/16	16.690	22.166	1/8	38.092	115.47
3/4	5.4978	2.4053	3/8	16.886	22.691	1/4	38.485	117.86
13/16	5.6941	2.5802	7/16	17.082	23.221	3/8	38.877	120.28
7/8	5.8905	2.7612	1/2	17.279	23.758	1/2	39.270	122.72
15/16	6.0868	2.9483	9/16	17.475	24.301	5/8	39.663	125.19
			5/8	17.671	24.850	3/4	40.055	127.68
2	6.2832	3.1416	11/16	17.868	25.406	7/8	40.448	130.19
1/16	6.4795	3.3410	3/4	18.064	25.967	13	40.841	132.73
1/8	6.6759	3.5466	13/16	18.261	26.535	1/8	41.233	135.30
3/16	6.8722	3.7583	7/8	18.457	27.109	1/4	41.626	137.89
1/4	7.0686	3.9761	15/16	18.653	27.688	3/8	42.019	140.50
5/16	7.2649	4.2000	6	18.850	28.274	1/2	42.412	143.14

(*Continued on page* 868)

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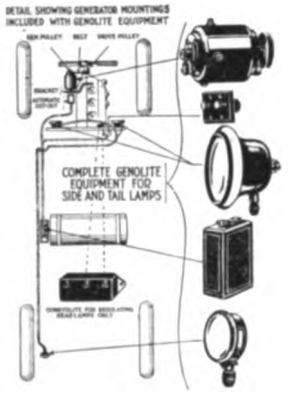

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CIRCUMFERENCES AND AREAS OF CIRCLES

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
13.. ⅝	42.804	145.80	21. ⅞	68.722	375.83	30. ⅛	94.640	712.76
¾	43.197	148.49	22.	69.115	380.13	¼	95.033	718.69
⅞	43.590	151.20	⅛	69.508	384.46	⅜	95.426	724.64
14.	43.982	153.94	¼	69.900	388.82	½	95.819	730.62
⅛	44.375	156.70	⅜	70.293	393.20	⅝	96.211	736.62
¼	44.768	159.48	½	70.686	397.61	¾	96.604	742.64
⅜	45.160	162.30	⅝	71.079	402.04	⅞	96.997	748.69
½	45.553	165.13	¾	71.471	406.49	31.	97.389	754.77
⅝	45.946	167.99	⅞	71.864	410.97	⅛	97.782	760.87
¾	46.338	170.87	23.	72.257	415.48	¼	98.175	766.99
⅞	46.731	173.78	⅛	72.649	420.00	⅜	98.567	773.14
15.	47 124	176.71	¼	73.042	424.56	½	98.960	779.31
⅛	47.517	179.67	⅜	73.435	429.13	⅝	99.353	785.51
¼	47.909	182.65	½	73.827	433.74	¾	99.746	791.73
⅜	48.302	185.66	⅝	74.220	438.36	⅞	100.138	797.98
½	48.695	188.69	¾	74.613	443.01	32.	100.531	804.25
⅝	49.087	191.75	⅞	75.006	447.69	⅛	100.924	810.54
¾	49.480	194.83	24.	75.398	452.39	¼	101.316	816.86
⅞	49.873	197.93	⅛	75.791	457.11	⅜	101.709	823.21
16.	50.265	201.06	¼	76.184	461.86	½	102.102	829.58
⅛	50.658	204.22	⅜	76.576	466.64	⅝	102.494	835.97
¼	51.051	207.39	½	76.969	471.44	¾	102.887	842.39
⅜	51.444	210.60	⅝	77.362	476.26	⅞	103.280	848.83
½	51.836	213.82	¾	77.754	481.11	33.	103.673	855.30
⅝	52.229	217.08	⅞	78.147	485.98	⅛	104.065	861.79
¾	52.622	220.35	25.	78.540	490.87	¼	104.458	868.31
⅞	53.014	223.65	⅛	78.933	495.79	⅜	104.851	874.85
17.	53.407	226.98	¼	79.325	500.74	½	105.243	881.41
⅛	53.800	230.33	⅜	79.718	505.71	⅝	105.636	888.00
¼	54.192	233.71	½	80.111	510.71	¾	106.029	894.62
⅜	54.585	237.10	⅝	80.503	515.72	⅞	106.421	901.26
½	54.978	240.53	¾	80.896	520.77	34.	106.814	907.92
⅝	55.371	243.98	⅞	81.289	525.84	⅛	107.207	914.61
¾	55.763	247.45	26.	81.681	530.93	¼	107.600	921.32
⅞	56.156	250.95	⅛	82.074	536.05	⅜	107.992	928.06
18.	56.549	254.47	¼	82.467	541.19	½	108.385	934.82
⅛	56.941	258.02	⅜	82.860	546.35	⅝	108.778	941.61
¼	57.334	261.59	½	83.252	551.55	¾	109.170	948.42
⅜	57.727	265.18	⅝	83.645	556.76	⅞	109.563	955.25
½	58.119	268.80	¾	84.038	562.00	35.	109.956	962.11
⅝	58.512	272.45	⅞	84.430	567.27	⅛	110.348	969.00
¾	58.905	276.12	27.	84.823	572.56	¼	110.741	975.91
⅞	59.298	279.81	⅛	85.216	577.87	⅜	111.134	982.84
19.	59.690	283.53	¼	85.608	583.21	½	111.527	989.80
⅛	60.083	287.27	⅜	86.001	588.57	⅝	111.919	996.78
¼	60.476	291.04	½	86.394	593.96	¾	112.312	1003.8
⅜	60.868	294.83	⅝	86.786	599.37	⅞	112.705	1010.8
½	61.261	298.65	¾	87.179	604.81	36.	113.097	1017.9
⅝	61.654	302.49	⅞	87.572	610.27	⅛	113.490	1025.0
¾	62.046	306.35	28.	87.965	615.75	¼	113.883	1032.1
⅞	62.439	310.24	⅛	88.357	621.26	⅜	114.275	1039.2
20.	62.832	314.16	¼	88.750	626.80	½	114.668	1046.3
⅛	63.225	318.10	⅜	89.143	632.36	⅝	115.061	1053.5
¼	63.617	322.06	½	89.535	637.94	¾	115.454	1060.7
⅜	64.010	326.05	⅝	89.928	643.55	⅞	115.846	1068.0
½	64.403	330.06	¾	90.321	649.18	37.	116.239	1075.2
⅝	64.795	334.10	⅞	90.713	654.84	⅛	116.632	1082.5
¾	65.188	338.16	29.	91.106	660.52	¼	117.024	1089.8
⅞	65.581	342.25	⅛	91.499	666.23	⅜	117.417	1097.1
21	65.973	346.36	¼	91.892	671.96	½	117.810	1104.5
⅛	66.366	350.50	⅜	92.284	677.71	⅝	118.202	1111.8
¼	66.759	354.66	½	92.677	683.49	¾	118.596	1119.2
⅜	67.152	358.84	⅝	93.070	689.30	⅞	118.988	1126.7
½	67.544	363.05	¾	93.462	695.13	38.	119.381	1134.1
⅝	67.937	367.28	⅞	93.855	700.98	⅛	119.773	1141.6
¾	68.330	371.54	30.	94.248	706.86	¼	120.166	1149.1

(Continued on page 870)

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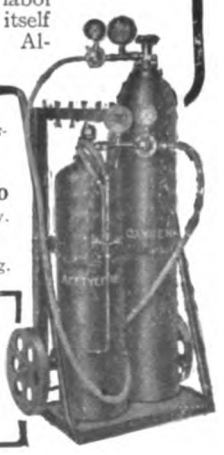

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CIRCUMFERENCES AND AREAS OF CIRCLES

Diam	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
38. ⅜	120.559	1156.6	46. ⅝	146.477	1707.4	54. ⅞	172.395	2365.0
½	120.951	1164.2	¾	146.869	1716.5	55.	172.788	2375.8
⅝	121.344	1171.7	⅞	147.262	1725.7	⅛	173.180	2386.6
¾	121.737	1179.3	47.	147.655	1734.9	¼	173.573	2397.5
⅞	122.129	1186.9	⅛	148.048	1744.2	⅜	173.966	2408.3
39.	122.522	1194.6	¼	148.440	1753.5	½	174.358	2419.2
⅛	122.915	1202.3	⅜	148.833	1762.7	⅝	174.751	2430.1
¼	123.308	1210.0	½	149.226	1772.1	¾	175.144	2441.1
⅜	123.700	1217.7	⅝	149.618	1781.4	⅞	175.536	2452.0
½	124.093	1225.4	¾	150.011	1790.8	56.	175.929	2463.0
⅝	124.486	1233.2	⅞	150.404	1800.1	⅛	176.322	2474.0
¾	124.878	1241.0	48.	150.796	1809.6	¼	176.715	2485.0
⅞	125.271	1248.8	⅛	151.189	1819.0	⅜	177.107	2496.1
40.	125.664	1256.6	¼	151.582	1828.5	½	177.500	2507.2
⅛	126.056	1264.5	⅜	151.975	1837.9	⅝	177.893	2518.3
¼	126.449	1272.4	½	152.367	1847.5	¾	178.285	2529.4
⅜	126.842	1280.3	⅝	152.760	1857.0	⅞	178.678	2540.6
½	127.235	1288.2	¾	153.153	1866.5	57.	179.071	2551.8
⅝	127.627	1296.2	⅞	153.545	1876.1	⅛	179.463	2563.0
¾	128.020	1304.2	49.	153.938	1885.7	¼	179.856	2574.2
⅞	128.413	1312.2	⅛	154.331	1895.4	⅜	180.249	2585.4
41.	128.805	1320.3	¼	154.723	1905.0	½	180.642	2596.7
⅛	129.198	1328.3	⅜	155.116	1914.7	⅝	181.034	2608.0
¼	129.591	1336.4	½	155.509	1924.4	¾	181.427	2619.4
⅜	129.983	1344.5	⅝	155.902	1934.2	⅞	181.820	2630.7
½	130.376	1352.7	¾	156.294	1943.9	58.	182.212	2642.1
⅝	130.769	1360.8	⅞	156.687	1953.7	⅛	182.605	2653.5
¾	131.161	1369.0	50.	157.080	1963.5	¼	182.998	2664.9
⅞	131.554	1377.2	⅛	157.472	1973.3	⅜	183.390	2676.4
42.	131.947	1385.4	¼	157.865	1983.2	½	183.783	2687.8
⅛	132.340	1393.7	⅜	158.258	1993.1	⅝	184.176	2699.3
¼	132.732	1402.0	½	158.650	2003.0	¾	184.569	2710.9
⅜	133.125	1410.3	⅝	159.043	2012.9	⅞	184 961	2722.4
½	133.518	1418.6	¾	159.426	2022.8	59.	185.354	2734.0
⅝	133.910	1427.0	⅞	159.829	2032.8	⅛	185.747	2745.6
¾	134.303	1435.4	51.	160.221	2042.8	¼	186.139	2757.2
⅞	134.696	1443.8	⅛	160.614	2052.8	⅜	186.532	2768.8
43.	135.088	1452.2	¼	161.007	2062.9	½	186.925	2780.5
⅛	135.481	1460.7	⅜	161.399	2073.0	⅝	187.317	2792.2
¼	135.874	1469.1	½	161.792	2083.1	¾	187.710	2803.9
⅜	136.267	1477.6	⅝	162.185	2093.2	⅞	188.103	2815.7
½	136.659	1486.2	¾	162.577	2103.3	60.	188.496	2827.4
⅝	137.052	1494.7	⅞	162.970	2113.5	⅛	188.888	2839.2
¾	137.445	1503.3	52.	163.363	2123.7	¼	189.281	2851.0
⅞	137.837	1511.9	⅛	163.756	2133.9	⅜	189.674	2862.9
44.	138.230	1520.5	¼	164.148	2144.2	½	190.066	2874.8
⅛	138.623	1529.2	⅜	164.541	2154.5	⅝	190.459	2886.6
¼	139.015	1537.9	½	164.934	2164.8	¾	190.852	2898.6
⅜	139.408	1546.6	⅝	165.326	2175.1	⅞	191.244	2910.5
½	139.801	1555.3	¾	165.719	2185.4	61.	191.637	2922.5
⅝	140.194	1564.0	⅞	166.112	2195.8	⅛	192.030	2934.5
¾	140.586	1572.8	53.	166.504	2206.2	¼	192.423	2946.5
⅞	140.979	1581.6	⅛	166.897	2216.6	⅜	192.815	2958.5
45.	141.372	1590.4	¼	167.290	2227.0	½	193.208	2970.6
⅛	141.764	1599.3	⅜	167.683	2237.5	⅝	193.601	2982.7
¼	142.157	1608.2	½	168.075	2248.0	¾	193.993	2994.8
⅜	142.550	1617.0	⅝	168.468	2258.5	⅞	194.386	3006.9
½	142.942	1626.0	¾	168.861	2269.1	62.	194.779	3019.1
⅝	143.335	1634.9	⅞	169.253	2279.6	⅛	195.171	3031.3
¾	143.728	1643.9	54.	169.646	2290.2	¼	195.564	3043.5
⅞	144.121	1652.9	⅛	170.039	2300.8	⅜	195.957	3055.7
46.	144.513	1661.9	¼	170.431	2311.5	½	196.350	3068.0
⅛	144.906	1670.9	⅜	170.824	2322.1	⅝	196.742	3080.3
¼	145.299	1680.0	½	171.217	2332.8	¾	197.135	3092.6
⅜	145.691	1689.1	⅝	171.609	2343.5	⅞	197.528	3104.9
½	146.084	1698.2	¾	172.002	2354.3	63.	197.920	3117.2

Index to Tables and Data appears on Pages 41 to 44.

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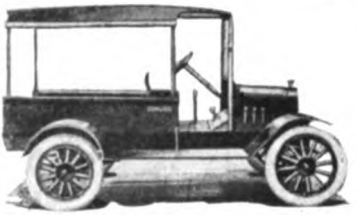
The Right Light Car of 1917



The New CORLISS Motor Truck

$650 f. o. b. Corliss, Wis.

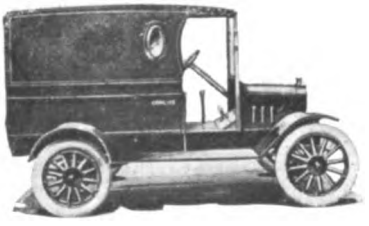
EXPRESS BODY

Specifications

Motor—3⅛x4½ *Speed*—25 m. p. h. *Transmission*—3. speed, selective type. *Axle*—¾ inches, floating. Weight carried on double row of roller bearings. *Drive shafts* may be pulled from axle without dissembling entire housing. Rear axle gear reduction 4½ to 1. *Wheelbase*—100 in. *Capacity*—1,000 lbs.

PARCEL BODY

$695 f. o. b. Corliss, Wis.



Our plant occupies 7 acres of ground, with 250,000 sq. ft. of floor space devoted entirely to the manufacture of light delivery trucks.

PATENTED

Financial strength of the CORLISS Motor Truck Co. insures stability and lasting connection. Experience behind the CORLISS Engine dates back almost to the beginning of the motor car industry.

The CORLISS Truck is constructed entirely of steel, for strength and service, with care in buying that allows for popular prices.

Exceptional opportunity and liberal discounts for dealers.

Corliss Motor Truck Co.
CORLISS WISCONSIN

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AREAS OF SMALL CIRCLES

Diameter	Areas									
	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0	.000078	.00031	.0007	.00125	.00196	.00283	.00385	.00503	.00636
.1	.0078	.0095	.0113	.0133	.0154	.0177	.0201	.0227	.0255	.0283
.2	.0314	.03464	.038	.0415	.0452	.0491	.0531	.0572	.0616	.066
.3	.0706	.0755	.0804	.0855	.0908	.0962	.1018	.1075	.1134	.1195
.4	.1256	.132	.1385	.1452	.1520	.1590	.1662	1735	.181	.1886
.5	.1963	.2043	.2124	.2206	.2290	.2376	.2463	.2552	.2642	.2734
.6	.2827	:2922	.3014	.3117	.3217	.3318	.3421	.3526	.3632	.3739
.7	.3848	.3959	.4071	.4185	.4301	.4418	.4536	.4657	.4778	.4902
.8	.5026	.5153	.5281	.5411	.5542	.5674	.5809	.5945	.6082	.6221
.9	.6362	.6504	.6648	.6793	.694	.7088	.7238	.739	.7543	.7698

DECIMAL EQUIVALENTS OF FRACTIONS OF AN INCH

1/64 = .0156	17/64 = .2656	33/64 = .5156	49/64 = .7656
1/32 = .0312	9/32 = .2812	17/32 = .5312	25/32 = .7812
3/64 = .0468	19/64 = .2968	35/64 = .5468	51/64 = .7968
1/16 = .0625	5/16 = .3125	9/16 = .5625	13/16 = .8125
5/64 = .0781	21/64 = .3281	37/64 = .5781	53/64 = .8281
3/32 = .0937	11/32 = .3437	19/32 = .5937	27/32 = .8437
7/64 = .1093	23/64 = .3593	39/64 = .6093	55/64 = .8593
1/8 = .1250	3/8 = .3750	5/8 = .6250	7/8 = .8750
9/64 = .1406	25/64 = .3906	41/64 = .6406	57/64 = .8906
5/32 = .1562	13/32 = .4062	21/32 = .6562	29/32 = .9062
11/64 = .1718	27/64 = .4218	43/64 = .6718	59/64 = .9218
3/16 = .1875	7/16 = .4375	11/16 = .6875	15/16 = .9375
13/64 = .2031	29/64 = .4531	45/64 = .7031	61/64 = .9531
7/32 = .2187	15/32 = .4687	23/32 = .7187	31/32 = .9687
15/64 = .2343	31/64 = .4843	47/64 = .7343	63/64 = .9843
1/4 = .2500	1/2 = .5000	3/4 = .7500	1 = 1.0000

Index to Tables and Data appears on Pages 41 to 44.

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DECIMAL FRACTIONS OF A LINEAR INCH IN MILLIMETRES

Inch	Milli-metres	Inch	Milli-metres	Inch	Milli-metres	Inches	Milli-metres
.01	.254	.29	7.366	.57	14.478	.85	21.590
.02	.508	.30	7.620	.58	14.732	.86	21.844
.03	.762	.31	7.874	.59	14.986	.87	22.098
.04	1.016	.32	8.128	.60	15.240	.88	22.352
.05	1.270	.33	8.382	.61	15.494	.89	22.606
.06	1.524	.34	8.636	.62	15.748	.90	22.860
.07	1.778	.35	8.890	.63	16.002	.91	23.114
.08	2.032	.36	9.114	.64	16.256	.92	23.368
.09	2.286	.37	9.398	.65	16.510	.93	23.622
.10	2.540	.38	9.652	.66	16.764	.94	23.876
.11	2.794	.39	9.906	.67	17.018	.95	24.130
.12	3.048	.40	10.160	.68	17.272	.96	24.384
.13	3.302	.41	10.414	.69	17.526	.97	24.638
.14	3.556	.42	10.668	.70	17.780	.98	24.892
.15	3.810	.43	10.922	.71	18.034	.99	25.146
.16	4.064	.44	11.176	.72	18.288	1.00	25.400
.17	4.318	.45	11.430	.73	18.542	2.00	50.799
.18	4.572	.46	11.684	.74	18.796	3.00	76.199
.19	4.826	.47	11.938	.75	19.050	4.00	101.598
.20	5.080	.48	12.192	.76	19.304	5.00	126.998
.21	5.334	.49	12.446	.77	19.558	6.00	152.397
.22	5.588	.50	12.700	.78	19.812	7.00	177.797
.23	5.842	.51	12.945	.79	20.066	8.00	203.196
.24	6.096	.52	13.208	.80	20.320	9.00	228.596
.25	6.350	.53	13.462	.81	20.574	10.00	253.995
.26	6.604	.54	13.716	.82	20.828	11.00	279.395
.27	6.858	.55	13.970	.83	21.082	12.00	304.794
.28	7.112	.56	14.224	.84	21.336	1 foot	

BOILING POINT OF WATER AT VARIOUS ALTITUDES

Altitude Above Sea Level in Feet	Boiling Point of Water in Degrees Fahrenheit
1,025	212
2,063	210
3,115	208
4,169	206
5,225	204
6,304	202
7,381	200
8,431	198
9,579	196
10,685	194
	192

It is considered good practice to maintain the temperature of the water in an automobile motor cooling system at about 202 degrees Fahrenheit, under normal operating conditions. This allows a working margin, under boiling point, for adverse conditions, such as climbing a long grade, car standing with motor running idle, or running with a retarded spark. Such a system would steam when a car running under normal conditions attained an altitude of about one mile. In cases where steaming occurs under normal conditions, at sea level, mountain climbing is practically impossible or necessitates very frequent stops for water to make up for evaporation.

Index to Tables and Data appears on Pages 41 to 44.

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UNITED STATES OFFICIAL MILLIMETERS CONVERSION TABLE

Millimeters	Equivalent in Inches	Millimeters	Equivalent in Inches
1	0.03,937	51	2.00,787
2	0.07,874	52	2.04,724
3	0.11,811	53	2.08,661
4	0.15,748	54	2.12,598
5	0.19,685	55	2.16,535
6	0.23,622	56	2.20,472
7	0.27,559	57	2.24,409
8	0.31,496	58	2.28,346
9	0.35,433	59	2.32,283
10	0.39,370	60	2.36,220
11	0.43,307	61	2.40,157
12	0.47,244	62	2.44,094
13	0.51,181	63	2.48,031
14	0.55,118	64	2.51,968
15	0.59,055	65	2.55,905
16	0.62,992	66	2.59,842
17	0.66,929	67	2.63,779
18	0.70,866	68	2.67,716
19	0.74,803	69	2.71,653
20	0.78,740	70	2.75,590
21	0.82,677	71	2.79,527
22	0.86,614	72	2.83,464
23	0.90,551	73	2.87,401
24	0.94,488	74	2.91,338
25	0.98,425	75	2.95,275
26	1.02,362	76	2.99,212
27	1.06,299	77	3.03,149
28	1.10,236	78	3.07,086
29	1.14,173	79	3.11,023
30	1.18,110	80	3.14,960
31	1.22,047	81	3.18,897
32	1.25,984	82	3.22,834
33	1.29,921	83	3.26,771
34	1.33,858	84	3.30,708
35	1.37,795	85	3.34,645
36	1.41,732	86	3.38,582
37	1.45,669	87	3.42,519
38	1.49,606	88	3.46,456
39	1.53,543	89	3.50,393
40	1.57,480	90	3.54,330
41	1.61,417	91	3.58,267
42	1.65,354	92	3.62,204
43	1.69,291	93	3.66,141
44	1.73,228	94	3.70,078
45	1.77,165	95	3.74,015
46	1.81,102	96	3.77,952
47	1.85,039	97	3.81,889
48	1.88,976	98	3.85.826
49	1.92,913	99	3.89,763
50	1.96,850	100	3.93 700

Index to Tables and Data appears on Pages 41 to 44.

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POUNDS PER SQUARE INCH IN KILOGRAMMES PER SQUARE CENTIMETRE

Lbs. per Square Inch	Kilogrammes per Square Centimetre	Lbs. per Square Inch	Kilogrammes per Square Centimetre	Lbs. per Square Inch	Kilogrammes per Square Centimetre	Lbs. per Square Inch	Kilogrammes per Square Centimetre
1	.0703	41	2.8826	81	5.6949	205	14.4129
2	.1406	42	2.9529	82	5.7652	210	14.7645
3	.2109	43	3.0232	83	5.8355	215	15.1160
4	.2812	44	3.0935	84	5.9058	220	15.4675
5	.3515	45	3.1638	85	5.9761	225	15.8191
6	.4218	46	3.2341	86	6.0464	230	16.1706
7	.4921	47	3.3044	87	6.1167	235	16.5221
8	.5624	48	3.3747	88	6.1870	240	16.8737
9	.6328	49	3.4450	89	6.2573	245	17.2252
10	.7031	50	3.5153	90	6.3276	250	17.5767
11	.7734	51	3.5856	91	6.3979	255	17.9283
12	.8437	52	3.6559	92	6.4682	260	18.2798
13	.9140	53	3.7263	93	6.5385	265	18.6313
14	.9843	54	3.7966	94	6.6088	270	18.9829
15	1.0546	55	3.8669	95	6.6722	275	19.3344
16	1.1249	56	3.9372	96	6.7495	280	19.6860
17	1.1952	57	4.0075	97	6.8198	285	20.0375
18	1.2655	58	4.0778	98	6.8901	290	20.3890
19	1.3358	59	4.1481	99	6.9604	295	20.7406
20	1.4062	60	4.2184	100	7.0307	300	21.0921
21	1.4764	61	4.2887	105	7.3822	310	21.7951
22	1.5467	62	4.3590	110	7.7338	320	22.4981
23	1.6171	63	4.4293	115	8.0853	330	23.2012
24	1.6874	64	4.4996	120	8.4368	340	23.9043
25	1.7577	65	4.5699	125	8.7884	350	24.6073
26	1.8280	66	4.6402	130	9.1399	360	25.3104
27	1.8983	67	4.7106	135	9.4914	370	26.0135
28	1.9686	68	4.7809	140	9.8430	380	26.7166
29	2.0389	69	4.8512	145	10.1945	390	27.4196
30	2.1092	70	4.9215	150	10.5460	400	28.1227
31	2.1795	71	4.9918	155	10.8976	410	28.8258
32	2.2498	72	5.0621	160	11.2491	420	29.5288
33	2.3201	73	5.1324	165	11.6006	430	30.2319
34	2.3905	74	5.2027	170	11.9522	440	30.9350
35	2.4607	75	5.2730	175	12.3037	450	31.6380
36	2.5310	76	5.3433	180	12.6553	460	32.3411
37	2.6013	77	5.4136	185	13.0068	470	33.0442
38	2.6717	78	5.4939	190	13.3583	480	33.7437
39	2.7420	79	5.5542	195	13.7099	490	34.4503
40	2.8123	80	5.6246	200	14.0614	500	35.1533

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A CONVENIENT METRIC CONVERSION (*Compiled by C. W. Hunt*)

Millimeters × .03937 = inches.
Millimeters ÷ 25.4 = inches.
Centimeters × .3937 = inches.
Centimeters ÷ 2.54 = inches.
Meters × 39.37 = inches. (Act of Congress.)
Meters × 3.281 = feet.
Meters × 1.094 = yards.
Kilometers × .6214 = miles.
Kilometers ÷ 1.6093 = miles.
Kilometers × 3280.8 = feet.
Square Millimeters × .00155 = square inches.
Square Millimeters ÷ 645.2 = square inches.
Square Centimeters × .155 = square inches.
Square Centimeters ÷ 6.452 = square inches.
Square Meters × 10.764 = square feet.
Square Kilometers × 247.1 = acres.
Hectare × 2.471 = acres.
Cubic Centimeters ÷ 16.387 = cubic inches.
Cubic Centimeters ÷ 3.697 = fl. drachms.
Cubic Centimeters ÷ 29.57 = fluid oz.
Cubic Meters × 35.314 = cubic feet.
Cubic Meters × 1.308 = cubic yards.
Cubic Meters × 264.2 = gallons (231 cubic inches)
Liters × 61.023 = cubic inches. (Act of Congress.)
Liters × 33.84 = fluid ounces.
Liters × .2642 = gallons (231 cubic inches).
Liters ÷ 3.785 = gallons (231 cubic inches).
Liters ÷ 28.317 = cubic feet.
Hectoliters × 3.531 = cubic feet.
Hectoliters × 2.838 = bushels (2150.42 cubic inches).
Hectoliters × .1308 = cubic yards.
Hectoliters × 26.42 = gallons (231 cubic inches).
Grammes × 15.432 = grains. (Act of Congress.)
Grammes × 981 = dynes.
Grammes ÷ 28.35 = ounces avoirdupois.
Joule × .7373 = foot pounds.
Kilograms × 2.2046 = pounds.
Kilograms × 35.27 = ounces avoirdupois.
Kilograms ÷ 907.2 = tons (2,000 pounds).
Kilograms per square cent. × 14.223 = pounds per square inch.
Kilogrammeters × 7.233 = foot lbs.
Kilo per Meter × .672 = lbs. per foot.
Kilo per Cu. Meter × .0624 = lbs. per cubic foot.
Kilo-watts × 1.34 = horse-power.
Watts ÷ 746 = horse-power.
Watts × .7373 = ft. pounds per second.
Caloric × 3.968 = B. T. U.
Cheval vapeur × .9863 = horse-power.
(Centigrade × 1.8) × 32 = degree Fahrenheit.
Francs × .193 = dollars.
Gravity. Paris = 980.94 Centimeter per sec.

FRENCH AND AMERICAN EQUIVALENT MEASURES

MEASURES OF LENGTH

French	*United States*
1 meter	39.37 inches, or 3.28083 feet
.3048 meter	1 foot
1 centimeter	.3937 inch
2.54 centimeters	1 inch
1 millimeter	.03937 inch, or 1-25 inch nearly
25.4 millimeters	1 inch
1 kilometer	1093.61 yards, or .62137 mile

(*Continued on page 877*)

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MEASURES OF WEIGHT

1 gramme	15.432 grains
.0648 gramme	1 grain
28.35 grammes	1 ounce avoirdupois
1 kilogramme	2.2046 pounds
.4536 kilogramme	1 pound
1 tonne or metric ton	.9842 ton of 2,240 pounds 19.68 cwt.
1000 kilogrammes	2204.6 pounds

MEASURES OF CAPACITY

Liter (1 cubic decimeter)	61.023 cubic inches .03531 cubic foot .2642 gallon (American) 2.202 pounds water at 62° F.
8.317 liters	1 cubic foot
4.543 liters	1 gallon (British)
3.785 liters	1 gallon (American)

TABLE OF KILOGRAMME CALORIES, EQUIVALENT TO BRITISH THERMAL UNITS

Brit. Th'm'l	0	1	2	3	4	5	6	7	8	9	Brit. Th'm'l
0	.....	.252	.504	.756	1.008	1.260	1.512	1.764	2.016	2.268	0
10	2.52	2.772	3.024	3.276	3.528	3.780	4.032	4.284	4.536	4.788	10
20	5.04	5.292	5.544	5.796	6.048	6.300	6.552	6.804	7.056	7.308	20
30	7.56	7.812	8.064	8.316	8.568	8.820	9.072	9.324	9.576	9.828	30
40	10.08	10.332	10.584	10.836	11.088	11.340	11.592	11.844	12.096	12.348	40
50	12.60	12.852	13.104	13.356	13.608	13.860	14.112	14.364	14.616	14.868	50
50	15.12	15.372	15.624	15.876	16.128	16.380	16.632	16.884	17.136	17.388	60
70	17.64	17.892	18.144	18.396	18.648	18.900	19.152	19.404	19.656	19.908	70
80	20.16	20.412	20.664	20.916	21.168	21.420	21.672	21.924	22.176	22.428	80
90	22.68	22.932	23.184	23.436	23.688	23.940	24.192	24.444	24.696	24.948	90

1 British thermal unit - 251.996 gramme calories.

Index to Tables and Data appears on Pages 41 to 44.

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LIST OF NINE DIFFERENT STANDARD GAUGES USED IN THE UNITED STATES

DECIMAL EQUIVALENTS (Inches)

No. of Gauge	American or Brown & Sharpe Iron Wire	Birmingham or Stubbs Iron Wire	Washburn & Moen Iron Wire	Imperial Wire Gauge	U. S. Standard for Plate (Iron & Steel)	Stubbs Steel Wire	Twist Drill and Steel Wire	Washburn & Moen Music Wire	Wood and Machine Screws	No. of Gauge	Fractional Parts of an Inch	Decimal Equiv. of Sixty-fourths, etc.
8-0	.....	.....	.....	.....	.....	.....	This gauge	.0083	....	8-0	1/64	.01563
7-0	.....	.....	.....	.....	.500	.....	from one to	.0087	....	7-0	1/32	.03125
6-0	.....	.....	.....	.464	.469	.....	three thous-	.0095	....	6-0	1/16	.625
5-0	.....	.....	.....	.432	.438	.....	andths larger	.010	....	5-0	5/64	.07813
4-0	.460	.454	.394	.400	.406	.....	than same Nos.	.011	....	4-0	3/32	.09375
3-0	.410	.425	.363	.372	.375	.....	of Stubbs steel	.012	.032	3-0	7/64	.10938
2-0	.365	.380	.331	.348	.344	.....	wire gauge	.013	.045	2-0	1/8	.125
0	.325	.340	.307	.334	.313	.....		.014	.058	0	9/64	.14063
1	.289	.300	.283	.300	.281	.277	.228	.016	.071	1	5/32	.15625
2	.258	.284	.263	.276	.266	.219	.221	.017	.084	2	11/64	.17188
3	.229	.259	.244	.252	.250	.212	.213	.018	.097	3	3/16	.1875
4	.204	.238	.225	.232	.234	.207	.209	.019	.110	4	13/64	.20313
5	.182	.220	.207	.212	.219	.204	.206	.020	.124	5	7/32	.21875
6	.162	.203	.192	.192	.203	.201	.204	.022	.137	6	15/64	.23438
7	.144	.180	.177	.176	.188	.199	.201	.023	.150	7	1/4	.25
8	.128	.165	.162	.160	.172	.197	.199	.024	.163	8	17/64	.26563
9	.114	.148	.148	.144	.156	.194	.196	.026	.176	9	9/32	.28125
10	.102	.134	.135	.128	.141	.191	.194	.027	.189	10	19/64	.29688
11	.091	.120	.121	.116	.125	.188	.191	.028	.203	11	5/16	.3125
12	.081	.109	.106	.104	.109	.185	.189	.030	.216	12	21/64	.32813
13	.072	.095	.092	.092	.094	.182	.185	.031	.229	13	11/32	.34375
14	.064	.083	.080	.080	.078	.180	.182	.033	.242	14	23/64	.35938
15	.057	.072	.072	.072	.070	.178	.180	.035	.255	15	3/8	.375
16	.051	.065	.063	.064	.063	.175	.177	.036	.268	16	25/64	.39063
17	.045	.058	.054	.056	.056	.172	.173	.038	.282	17	13/32	.40625
18	.040	.049	.048	.048	.050	.168	.170	.040	.295	18	27/64	.42188
19	.036	.042	.041	.040	.044	.164	.166	.041	.308	19	7/16	.4375
20	.032	.035	.035	.036	.038	.161	.161	.043	.321	20	29/64	.45313
21	.028	.032	.032	.032	.034	.157	.159	.046	.334	21	15/32	.46875
22	.025	.028	.029	.028	.031	.155	.157	.048	.347	22	31/64	.48438
23	.023	.025	.026	.024	.028	.153	.154	.051	.360	23	1/2	.5
24	.020	.022	.023	.022	.025	.151	.152	.055	.374	24	33/64	.51563
25	.018	.020	.020	.020	.022	.148	.150	.059	.387	25	17/32	.53125
26	.016	.018	.018	.018	.019	.146	.147	.063	.400	26	35/64	.54688
27	.0141	.016	.0173	.0164	.0171	.143	.144	.066	.413	27	9/16	.5625
28	.0126	.014	.0162	.0149	.0156	.139	.141	.072	.426	28	37/64	.57813
29	.0112	.013	.015	.0136	.014	.134	.136	.076	.439	29	19/32	.59375
30	.010	.012	.014	.0124	.0125	.127	.129	.080	.453	30	39/64	.60938
31	.0089	.010	.0132	.0116	.0109	.120	.120	....	.466	31	5/8	.625
32	.0079	.009	.0128	.0108	.0101	.115	.116	....	.479	32	41/64	.64063
33	.007	.008	.0118	.010	.0093	.112	.113	....	.492	33	21/32	.65625
34	.0063	.007	.0104	.0092	.0085	.110	.111	....	.505	34	43/64	.67188
35	.0056	.005	.0095	.0084	.0078	.108	.110	....	.518	35	11/16	.6875
36	.005	.004	.009	.0076	.007	.106	.1065	....	.532	36	45/64	.70313
37	.0044	.....	.....	.0068	.0066	.103	.104	....	.545	37	23/32	.71875
38	.0039	.....	.....	.006	.0062	.101	.1015	....	.558	38	47/64	.73438
39	.0035	.....	.....	.0052	.....	.099	.0995	....	.571	39	3/4	.75
40	.0031	.....	.....	.0048	.....	.097	.098	....	.584	40	49/64	.76563
41	.....	.....	.....	.....	.....	.095	.096	....	.597	41	25/32	.78125
42	.....	.....	.....	.....	.....	.092	.094	....	.611	42	51/64	.79688
43	.....	.....	.....	.....	.....	.088	.089	....	.624	43	13/16	.8125
44	.....	.....	.....	.....	.....	.085	.086	....	.637	44	53/64	.82813
45	.....	.....	.....	.....	.....	.081	.082	....	.650	45	27/32	.84375
46	.....	.....	.....	.....	.....	.079	.081	....	.663	46	55/64	.85938
47	.....	.....	.....	.....	.....	.077	.079	....	.676	47	7/8	.875
48	.....	.....	.....	.....	.....	.075	.076	....	.690	48	57/64	.89063
49	.....	.....	.....	.....	.....	.072	.073	....	.703	49	29/32	.90625
50	.....	.....	.....	.....	.....	.069	.070	....	.716	50	59/64	.92188

Letter Sizes Stubbs Steel Wire

A	.234	I	.272	R	.339
B	.238	J	.277	S	.348
C	.242	K	.281	T	.358
D	.246	L	.290	U	.368
E	.250	M	.295	V	.377
F	.257	N	.302	W	.386
G	.261	O	.316	X	.397
H	.266	P	.323	Y	.404
		Q	.332	Z	.413

Index to Tables and Data appears on Pages 41 to 44.

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SIZES OF NUMBERS OF THE UNITED STATES STANDARD GAUGE FOR SHEET AND PLATE IRON AND STEEL

An Act Establishing a Standard Gauge for Sheet and Plate Iron and Steel

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: That for the purpose of securing uniformity the following is established as the only gauge for sheet and plate iron and steel in the United States of America, namely:

Number of Gauge	Approximate Thickness in Fractions of an Inch	Approximate Thickness in Decimal Parts of an Inch	Weight per Square Foot in Ounces Avoirdupois	Weight per Square Foot in Pounds Avoirdupois
0000000	1/2	.5	320	20.00
000000	15/32	.46875	300	18.75
00000	7/16	.4375	280	17.50
0000	13/32	.40625	260	16.25
000	3/8	.375	240	15.00
00	11/32	.34375	220	13.75
0	5/16	.3125	200	12.50
1	9/32	.28125	180	11.25
2	17/64	.265625	170	10.625
3	1/4	.25	160	10.00
4	15/64	.234375	150	9.375
5	7/32	.21875	140	8.75
6	13/64	.203125	130	8.125
7	3/16	.1875	120	7.5
8	11/64	.171875	110	6.875
9	5/32	.15625	100	6.25
10	9/64	.140625	90	5.625
11	1/8	.125	80	5.00
12	7/64	.109375	70	4.375
13	3/32	.09375	60	3.75
14	5/64	.078125	50	3.125
15	9/128	.0703125	45	2.8125
16	1/16	.0625	40	2.5
17	9/160	.05625	36	2.25
18	1/20	.05	32	2.
19	7/160	.04375	28	1.75
20	3/80	.0375	24	1.50
21	11/320	.034375	22	1.375
22	1/32	.03125	20	1.25
23	9/320	.028125	18	1.25
24	1/40	.025	16	1.
25	7/320	.021875	14	.875
26	3/160	.01875	12	.75
27	11/640	.0171875	11	.6875
28	1/64	.015625	10	.625
29	9/640	.0140625	9	.5625
30	1/80	.0125	8	.5
31	7/640	.0109375	7	.4375
32	13/1280	.01015625	6½	.40625
33	3/320	.009375	6	.375
34	11/1280	.00859375	5½	.34375
35	5/640	.0078125	5	.3125
36	9/1280	.00703125	4½	.28125
37	17/2560	.006640625	4¼	.265625
38	1/160	.00625	4	.25

And on and after July first, eighteen hundred and ninety-three, the same and no other shall be used in determining duties and taxes levied by the United States of America on sheet and plate iron and steel. But this act shall not be construed to increase duties upon any articles which may be imported.

Sec. 3.—That in the practical use and application of the standard gauge hereby established a variation of two and one-half per cent. either way may be allowed.

Approved March 3, 1893

Index to Tables and Data appears on Pages 41 to 44.

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THERMOMETER SCALES

There are two thermometer scales in general use in the United States: Fahrenheit and Centigrade. In the Fahrenheit thermometer the temperature of melting ice is taken at 32 degrees and boiling point at 212 degrees; thus there are 180 degrees between the two extremes. In the Centigrade thermometer the distance between these two points on the scale is divided into exactly 100 degrees. In order to convert degrees Fahrenheit into degrees Centigrade: Subtract 32, multiply the remainder by 5, and divide by 9. Thus, convert 158 degrees Fahrenheit to degrees Centigrade:

$$\text{Then } (158-32)\frac{5}{9}=70^\circ \text{ Cent.}$$

Or to convert degrees Centigrade into degrees Fahrenheit: Multiply by 9, divide by 5 and add 32. Thus, convert 70 degrees Centigrade into degrees Fahrenheit:

$$\text{Then } (70\times\frac{9}{5})+32=158^\circ \text{ Fahr.}$$

Following is a table giving the equivalent degrees of the Fahrenheit and Centigrade scales, from 1 to 100 Centigrade:

Cent.	Fahr.	Cent.	Fahr.	Cent.	Fahr.
0	*32.0	35	95.0	70	158.0
1	33.8	36	96.8	71	159.8
2	35.6	37	98.6	72	161.6
3	37.4	38	100.4	73	163.4
4	39.2	39	102.2	74	165.2
5	41.0	40	104.0	75	167.0
6	42.8	41	105.8	76	168.8
7	44.6	42	107.6	77	170.6
8	46.4	43	109.4	78	172.4
9	48.2	44	111.2	79	174.2
10	50.0	45	113.0	80	176.0
11	51.8	46	114.8	81	177.8
12	53.6	47	116.6	82	179.6
13	55.4	48	118.4	83	181.4
14	57.2	49	120.2	84	183.2
15	59.0	50	122.0	85	185.0
16	60.8	51	123.8	86	186.8
17	62.6	52	125.6	87	188.6
18	64.4	53	127.4	88	190.4
19	66.2	54	129 2	89	192.2
20	68.0	55	131.0	90	194.0
21	69.8	56	132.8	91	195.8
22	71.6	57	134.6	92	197.6
23	73.4	58	136.4	93	199.4
24	75.2	59	138.2	94	201.2
25	77.0	60	140.0	95	203.0
26	78.8	61	141.8	96	204.8
27	80.6	62	143.6	97	206.6
28	82.4	63	145.4	98	208.4
29	84.2	64	147.2	99	210.2
30	86.0	65	149.0	100	†212.0
31	87.8	66	150.8	..	.....
32	89.6	67	152.6	..	.....
33	91.4	68	154.4	..	.....
34	93.2	69	156.2	..	.....

* Freezing point.
† Boiling point.

It will be noticed that for each degree Centigrade the Fahrenheit scale rises 1.8 degrees, so that if we multiply the degrees Centigrade by 1.8 and add 32 we will get the equivalent number of degrees Fahrenheit. In the Fahrenheit thermometer the freezing and boiling points of water are taken at the mean atmospheric pressure at the sea level, 14.7 pounds to the square inch.

Index to Tables and Data appears on Pages 41 to 44.

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FORMULAS FOR CONVERSION OF THERMOMETER SCALES

To convert degrees, Centigrade or Réaumur, into degrees Fahrenheit·
Let F = No. of degrees Fahrenheit.
C = " " " Centigrade.
R = " " " Réaumur.

$$F = \frac{9C}{5} + 32; \qquad F = \frac{9R}{4} + 32;$$

$$C = \frac{5\,(F - 32)}{9} \qquad R = \frac{4\,(F - 32)}{9}$$

Freezing point, or 32° Fah. = zero in Cent. or Réaumur.
Boiling point, or 212° Fah. = 100° Cent., or 80° Réaumur.

BAUME HYDROMETER AND SPECIFIC GRAVITY EQUIVALENTS

(*American Standard*)

For liquids heavier than water, at 60° F

$$\text{Sp. Gr.} = \frac{145}{145 - {}^\circ\text{Bé}}$$

Baumé	Specific Gravity	Baumé	Specific Gravity	Baumé	Specific Gravity
0.0	1.000	17.5	1.137	35.0	1.318
0.5	1.003	18.0	1.141	36.0	1.330
1.0	1.006	18.5	1.146	37.0	1.342
1.5	1.010	19.0	1.150	38.0	1.355
2.0	1.014	19.5	1.155	39.0	1.367
2.5	1.017	20.0	1.160	40.0	1.381
3.0	1.021	20.5	1.164	45.0	1.450
3.5	1.024	21.0	1.169	50.0	1.526
4.0	1.028	21.5	1.174	55.0	1.611
4.5	1.032	22.0	1.178	60.0	1.705
5.0	1.035	22.5	1.183	65.0	1.812
5.5	1.039	23.0	1.188	70.0	1.933
6.0	1.043	23.5	1.193	....	.....
6.5	1.046	24.0	1.198	....	.....
7.0	1.050	24.5	1.203	....	.....
7.5	1.054	25.0	1.208	....	.....
8.0	1.058	25.5	1.213	....	.....
8.5	1.062	26.0	1.218	....	.....
9.0	1.066	26.5	1.223	....	.....
9.5	1.070	27.0	1.228	....	.....
10.0	1.074	27.5	1.234	....	.....
10.5	1.078	28.0	1.239	....	.....
11.0	1.082	28.5	1.244	....	.....
11.5	1.086	29.0	1.250	....	.....
12.0	1.090	29.5	1.255	....	.....
12.5	1.094	30.0	1.260	....	.....
13.0	1.098	30.5	1.266	....	.....
13.5	1.102	31.0	1.271	....	.....
14.0	1.106	31.5	1.277	....	.....
14.5	1.111	32.0	1.283	....	.....
15.0	1.115	32.5	1.288	....	.....
15.5	1.119	33.0	1.294	....	.....
16.0	1.124	33.5	1.300	....	.....
16.5	1.128	34.0	1.306	....	.....
17.0	1.132	34.5	1.312	....	.....

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WEIGHTS OF METALS

	Lbs. per Cu. Ft.	Lbs. per Cu. In.
Aluminum, cast	160	.0926
Brass, cast	506.3	.293
Brass, sheet	528	.3056
Babbitt metal	440.6	.255
Bronze, aluminum	471.2	.2727
Bronze, phosphor	575.8	.3332
Copper wire	555.1	.3212
Cast iron	450.	.2604
Wrought iron, bars	486.8	.2817
Steel, Bessemer	490.7	.284
Lead, cast	709.5	.4106
Nickel	548.7	.3175
Tin	458.3	.2652
Zinc	436.5	.2526

MELTING POINTS OF METALS

Cast iron	2210 deg. Fahr
Wrought iron	2912 " "
Steel	2500 " "
Copper	2160 " "
Brass	1900 " "
Aluminum (pure)	1112 " "
Lead	608 " "
Tin	446 " "

PROPORTIONATE WEIGHT OF CASTINGS TO WEIGHT OF WOOD PATTERNS

A Pattern Weighing One Pound, Made of (Less Weight of Core Prints)	Cast Iron	Brass	Copper	Bronze	Bell Metal	Zinc
Pine or Fir	16	15.8	16.7	16.3	17.1	13.5
Oak	9	10.1	10.4	10.3	10.9	8.6
Beech	9.7	10.9	11.4	11.3	11.9	9.1
Linden	13.4	15.1	16.7	15.5	16.3	12.9
Pear	10.2	11.5	11.9	11.8	12.4	9.8
Birch	10.6	11.9	12.3	12.2	12.9	10.2
Alder	12.8	14.3	14.9	14.7	15.5	12.2
Mahogany	11.7	13.2	13.7	13.5	14.2	11.2
Brass	0.85	0.95	0.99	0.98	1.0	0.81

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WEIGHT OF STEEL PER LINEAR FOOT

FLAT SIZES

	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½	1¾	2	2¼	2½	2¾	3	3½	4	5	6	7
⅛	.213	.266	.320	.372	.426	.479	.530	.585	.640	.745	.850	.955	1.07	1.18	1.28	1.49	1.70	2.13	2.56	2.98
9/16	.319	.399	.480	.558	.639	.718	.790	.878	.960	1.12	1.28	1.43	1.60	1.76	1.92	2.24	2.55	3.20	3.83	4.47
¼	.425	.533	.640	.743	.852	.958	1.06	1.17	1.28	1.49	1.70	1.91	2.13	2.34	2.56	2.98	3.40	4.26	5.11	5.96
5/16	.531	.665	.800	.929	1.06	1.20	1.33	1.46	1.60	1.86	2.13	2.39	2.66	2.92	3.19	3.72	4.25	5.32	6.38	7.44
⅜	.638	.798	.960	1.12	1.28	1.43	1.59	1.75	1.91	2.23	2.55	2.87	3.20	3.51	3.83	4.46	5.10	6.40	7.66	8.92
7/16	.744	.931	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.60	2.98	3.35	3.72	4.09	4.46	5.21	5.95	7.44	8.92	10.40
½	.....	1.07	1.28	1.49	1.70	1.91	2.13	2.34	2.55	2.98	3.40	3.83	4.26	4.68	5.10	5.96	6.80	8.52	10.20	11.90
9/16	.....	1.20	1.44	1.67	1.91	2.15	2.39	2.63	2.87	3.35	3.83	4.30	4.78	5.26	5.74	6.69	7.65	9.56	11.50	13.40
⅝	.....	.....	1.60	1.86	2.12	2.39	2.66	2.92	3.19	3.72	4.26	4.79	5.32	5.86	6.39	7.44	8.52	10.64	12.78	14.90
11/16	.....	.....	1.76	2.04	2.34	2.63	2.92	3.22	3.51	4.09	4.68	5.26	5.84	6.43	7.01	8.18	9.35	11.70	14.00	16.40
¾	.....	.....	.....	2.23	2.55	2.86	3.19	3.50	3.83	4.46	5.10	5.74	6.40	7.02	7.65	8.92	10.20	12.80	15.30	17.90
13/16	.....	.....	.....	2.41	2.76	3.11	3.45	3.80	4.14	4.83	5.53	6.22	6.91	7.60	8.29	9.67	11.10	13.80	16.60	19.30
⅞	.....	.....	.....	.....	2.98	3.34	3.72	4.09	4.46	5.21	5.96	6.70	7.46	8.19	8.94	10.42	11.92	14.87	17.88	20.80
15/16	.....	.....	.....	.....	3.19	3.59	3.98	4.38	4.78	5.58	6.38	7.17	7.97	8.77	9.56	11.20	12.80	15.90	19.10	22.40
1	.....	.....	.....	.....	.....	3.82	4.25	4.68	5.10	5.96	6.80	7.66	8.52	9.36	10.20	11.92	13.60	17.04	20.40	23.80
1⅛	.....	.....	.....	.....	.....	.....	4.78	5.27	5.74	6.71	7.65	8.61	9.59	10.54	11.48	13.41	15.30	19.17	22.95	26.80
1¼	.....	.....	.....	.....	.....	.....	.....	5.85	6.38	7.45	8.50	9.57	10.65	11.71	12.76	14.90	17.00	21.30	25.61	29.76
1⅜	.....	.....	.....	.....	.....	.....	.....	7.02	7.67	8.94	10.20	11.49	12.78	14.04	15.30	17.88	20.40	25.56	30.60	35.70

Index to Tables and Data appears on Pages 41 to 44.

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WEIGHT IN POUNDS OF SHEET AND BAR ALUMINUM, BRASS AND STEEL

Thickness or Diam. in Inch		Sheets per Square Foot			Square Bars, One Foot Long			Round Bars, One Foot Long		
Fraction	Dec.	Alum.	Brass	Steel	Alum.	Brass	Steel	Alum.	Brass	Steel
1/16	.0625	.869	2.77	2.52	.004	.014	.013	.003	.011	.010
1/8	.125	1.739	5.55	5.10	.018	.057	.053	.014	.047	.042
3/16	.1875	2.609	8.32	7.65	.041	.131	.119	.032	.102	.094
1/4	.2500	3.479	11.10	10.20	.072	.230	.212	.057	.182	.167
5/16	.3125	4.348	13.87	12.75	.114	.380	.333	.089	.284	.261
3/8	.3750	5.218	16.64	15.30	.163	.520	.478	.128	.408	.375
7/16	.4375	6.088	19.42	17.85	.222	.708	.651	.174	.555	.511
1/2	.5000	6.958	22.20	20.40	.290	.925	.850	.227	.724	.667
9/16	.5625	7.827	24.97	22.95	.367	1.171	1.076	.288	.919	.845
5/8	.6250	8.697	27.74	25.50	.453	1.445	1.328	.356	1.136	1.043
11/16	.6875	9.567	30.52	28.05	.548	1.748	1.608	.430	1.372	1.262
3/4	.7500	10.436	33.29	30.60	.652	2.080	1.913	.516	1.646	1.502
13/16	.8125	11.306	36.07	33.15	.766	2.445	2.245	.601	1.917	1.763
7/8	.8750	12.175	38.84	35.70	.888	2.833	2.603	.697	2.223	2.044
15/16	.9375	13.045	41.61	38.25	1.019	3.251	2.989	.800	2.552	2.347
1	1.0000	13.915	44.39	40.80	1.159	3.697	3.400	.911	2.906	2.670
1 1/16	1.0625	14.784	47.16	43.35	1.309	4.176	3.838	1.028	3.279	3.014
1 1/8	1.125	15.654	49.94	45.90	1.467	4.630	4.303	1.152	3.675	3.379
1 3/16	1.1875	16.524	52.71	48.45	1.635	5.216	4.795	1.284	4.096	3.766
1 1/4	1.2500	17.394	55.48	51.00	1.812	5.780	5.312	1.423	4.539	4.173
1 5/16	1.3125	18.263	58.26	53.55	1.997	6.370	5.857	1.569	5.003	4.600
1 3/8	1.3750	19.133	61.04	56.10	2.192	6.692	6.428	1.722	5.491	5.049
1 7/16	1.4375	20.002	63.81	58.65	2.396	7.644	7.026	1.882	6.002	5.518
1 1/2	1.5000	20.872	66.58	61.20	2.609	8.322	7.650	2.049	6.536	6.008
1 9/16	1.5625	21.741	69.35	63.75	2.831	9.030	8.301	2.223	7.091	6.520
1 5/8	1.6250	22.611	72.13	66.30	3.062	9.768	8.978	2.405	7.672	7.051
1 11/16	1.6875	23.481	74.90	68.85	3.302	10.53	9.682	2.593	8.271	7.604
1 3/4	1.7500	24.350	77.67	71.40	3.550	11.32	10.41	2.789	8.896	8.178
1 13/16	1.8125	25.250	80.54	73.95	3.810	12.15	11.17	2.992	9.544	8.773
1 7/8	1.8750	26.090	83.22	76.50	4.075	13.00	11.95	3.202	10.21	9.388
1 15/16	1.9375	26.960	86.00	79.05	4.352	13.88	12.76	3.417	10.90	10.02
2	2.0000	27.829	88.77	81.60	4.638	14.79	13.60	3.642	11.62	10.68

WEIGHT OF ALUMINUM, IRON, COPPER, BRASS AND LEAD BALLS

Dia. In.	Alum., Lbs.	Iron, Lbs.	Copper, Lbs.	Brass, Lbs.	Lead, Lbs.	Dia., In.	Alum. Lbs.	Iron, Lbs.	Copper Lbs.	Brass, Lbs.	Lead, Lbs.
1	.045	.136	.166	.158	.214	7	15.58	46.76	57.1	54.5	73.7
1½	.153	.46	.562	.537	.727	7½	19.17	57.52	70.0	67.11	90.0
2	.363	1.09	1.3	1.25	1.7	8	23.27	69.81	85.2	81.4	110.1
2½	.710	2.13	2.60	2.50	3.35	8½	27.91	83.73	102.3	100.0	132.3
3	1.22	3.68	4.5	4.3	5.8	9	33.10	99.4	121.3	115.9	156.7
3½	1.94	5.84	7.14	6.82	9.23	9½	38.90	116.9	143.0	136.4	184.7
4	2.90	8.72	10.7	10.2	13.8	10	45.45	136.35	166.4	159.0	215.0
4½	3.13	12.42	15.25	14.5	19.6	10½	52.60	157.84	193.0	184.0	250.0
5	5.68	17.04	20.8	19.9	26.9	11	60.49	181.48	221.8	211.8	286.7
5½	7.56	22.68	27.74	26.47	36.0	11½	69.12	207.37	253.5	242.0	327.7
6	9.81	29.45	35.9	34.3	46.4	12	78.54	235.62	288.1	275.0	372.[illegible]
6½	12.48	37.44	45.76	43.67	59.13						

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INTERNATIONAL (METRIC SYSTEM) STANDARD 60° THREAD

Diameter of Screw	Pitch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
Millimetres	*Millimetres*	*Millimetres*	*Millimetres*
3	.5	2.35	.06
4	.75	3.03	.09
5	.75	4.03	.09
6	1.0	4.70	.13
7	1.0	5.70	.13
8	1.0	6.70	.13
8	1.25	6.38	.16
9	1.0	7.70	.13
9	1.25	7.38	.16
10	1.5	8.05	.19
11	1.5	9.05	.19
12	1.5	10.05	.19
12	1.75	9.73	22
14	2.0	11.40	.25
16	2.0	13.40	.25
18	2.5	14.75	.31
20	2.5	16.75	.31
22	2.5	18.75	.31
22	3.0	18.10	.38
24	3.0	20.10	.38
26	3.0	22.10	.38
27	3.0	23.10	.38
28	3.0	24.10	.38
30	3.5	25.45	.44
32	3.5	27.45	.44
33	3.5	28.45	.44
34	3.5	29.45	.44
36	4.0	30.80	.5
38	4.0	32.80	.5
39	4.0	33.80	.5
40	4.0	34.80	.5
42	4.5	36.15	.56
44	4.5	38.15	.56
45	4.5	39.15	.56
46	4.5	40.15	.56
48	5.0	41.51	.63
50	5.0	43.51	.63
52	5.0	45.51	.63

NOTE.—This thread is largely used by Italian constructors.

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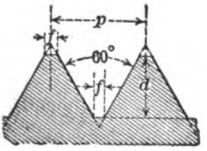
UNITED STATES 60° SCREW THREAD



Formula
$$\begin{cases} p = \text{pitch} = \dfrac{1}{\text{No. threads per inch}} \\ d = \text{depth} = p \times .6495 \\ f = \text{flat} = \dfrac{p}{8} \end{cases}$$

Diameter of Screw	Threads to Inch	Diameter at Root of Thread	Width of Flat
¼	20	.185	.0063
5/16	18	.2403	.0069
⅜	16	.2936	.0078
7/16	14	.3447	.0089
½	13	.4001	.0096
9/16	12	.4542	.0104
⅝	11	.5069	.0114
¾	10	.6201	.0125
⅞	9	.7307	.0139
1	8	.8376	.0156
1⅛	7	.9394	.0179
1¼	7	1.0644	.0179
1⅜	6	1.1585	.0208
1½	6	1.2835	.0208
1⅝	5½	1.3888	.0227
1¾	5	1.4902	.0250
1⅞	5	1.6152	.0250
2	4½	1.7113	.0278
2¼	4½	1.9613	.0278
2½	4	2.1752	.0313
2¾	4	2.4252	.0313
3	3½	2.6288	.0357
3¼	3½	2.8788	.0357
3½	3¼	3.1003	.0385
3¾	3	3.3170	.0417
4	3	3.5670	.0418
4¼	2⅞	3.7982	.0455
4½	2¾	4.0276	.0455
4¾	2⅝	4.2551	.0476
5	2½	4.4804	.0500
5¼	2½	4.7304	.0500
5½	2⅜	4.9530	.0526
5¾	2⅜	5.2030	.0526
6	2¼	5.4226	.0556

Standard Proportions for Machine Screws

The report of the committee on standard proportions for machine screws of the American Society of Mechanical Engineers is published in the October, 1906, proceedings of the society. The report is substantially in agreement with the recommendations adopted at the joint meeting held in New York, April 11, 1904.

The committee believes the following combined details to be essential in establishing and maintaining a standard for the diameters, threads and heads of machine screws, including, as it does, diameters, threads and limits for the taps which are to be used in connection therewith: (*a*) form of thread, (*b*) diameters, (*c*) number of threads per inch, (*d*) standard reference thread gauges, basic and for screws and taps, (*e*) working gauges for screws and taps, (*f*) limits of variation, measured in the angle of the thread, (*g*) limits of variation in external diameter, (*h*) limits of variation in the pitch of the thread screws and taps, (*k*) proportions of the heads.

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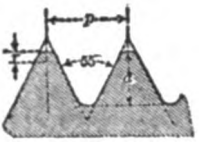
WHITWORTH STANDARD THREAD



Formula

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$
$$d = \text{depth} = p \times .64033$$
$$r = \text{radius} = p \times .1373$$

Full Diameter	No. of Threads per Inch	Pitch	Standard Depth of Thread	Effective Diameter	Core Diameter	Cross Sectional Area at Bottom of Thread
1/4 (.25)	20	.0500	.0320	.2180	.1860	.0272
5/16 (.3125)	18	.0556	.0356	.2769	.2414	.0458
3/8 (.375)	16	.0625	.0400	.3350	.2950	.0683
7/16 (.4375)	14	.0714	.0457	.3918	.3460	.0940
1/2 (.5)	12	.0833	.0534	.4466	.3933	.1215
9/16 (.5625)	12	.0833	.0534	.5091	.4558	.1632
5/8 (.625)	11	.0909	.0582	.5668	.5086	.2032
11/16 (.6875)	11	.0909	.0582	.6293	.5711	.2562
3/4 (.75)	10	.1000	.0640	.6860	.6219	.3038
13/16 (.8125)	10	.1000	.0640	.7485	.6844	.3679
7/8 (.875)	9	.1111	.0711	.8039	.7327	.4216
1	8	.1250	.0800	.9200	.8399	.5540
1 1/8 (1.125)	7	.1429	.0915	1.0335	.9420	.6969
1 1/4 (1.25)	7	.1429	.0915	1.1585	1.0670	.8942
1 3/8 (1.375)	6	.1667	.1067	1.2683	1.1616	1.0597
1 1/2 (1.5)	6	.1667	.1067	1.3933	1.2866	1.3001
1 5/8 (1.625)	5	.2000	.1281	1.4969	1.3689	1.4718
1 3/4 (1.75)	5	.2000	.1281	1.6219	1.4939	1.7528
2	4 1/2	.2222	.1423	1.8577	1.7154	2.3111
2 1/4 (2.25)	4	.2500	.1601	2.0899	1.9298	2.9249
2 1/2 (2.5)	4	.2500	.1601	2.3399	2.1798	3.7318
2 3/4 (2.75)	3 1/2	.2857	.1830	2.5670	2.3841	4.4641
3	3 1/2	.2857	.1830	2.8170	2.6341	5.4496
3 1/4 (3.25)	3 1/4	.3077	.1970	3.0530	2.8560	6.4063
3 1/2 (3.50)	3 1/4	.3077	.1970	3.3030	3.1060	7.5769
3 3/4 (3.75)	3	.3333	.2134	3.5366	3.231	8.6732
4	3	.3333	2134	3.7866	3.5731	10.0272
4 1/2 (4.50)	2 7/8	.3478	.2227	4.2773	4.0546	12.9118
5	2 3/4	.3636	.2328	4.7672	4.5343	16.1477
5 1/2 (5.50)	2 5/8	.3810	.2439	5.2561	5.0121	19.7301
6	2 1/2	.4000	.2561	5.7439	5.4877	23.6521

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DRILL SIZES FOR STANDARD THREADS

These sizes give an allowance above the bottom of thread on sizes ¼ to 2; varying respectively as follows: for " V " Threads, .010″ to .055″; for U. S. S. and Whitworth threads .005″ to .027″.

These are found by adding to the size at bottom of thread ¼ of the pitch for " V " threads, and ⅛ of the pitch for U. S. S. and Whitworth, the pitch being equal to 1″ ÷ No. of threads per 1″.

In practice it is better to use a larger drill if the exact size called for cannot be had.

Size Screw	No. of Threads	Size of Drill			Size Screw	No. of Threads	Size of Drill		
		U. S. S.	" V "	W.			U. S. S.	" V "	W.
¼	24	.201	.196	.202	15/16	9	.808	.790	.810
¼	20	.191	.184	.192	1	8	.854	.832	.856
5/16	18	.248	.239	.249	1 1/16	8	.917	.894	.919
⅜	16	.302	.293	.303	1 ⅛	7	.957	.932	.960
7/16	14	.354	.345	.355	1 ¼	7	1.082	1.057	1.085
½	13	.409	.399	.410	1 ⅜	6	1.179	1.144	1.182
½	12	.402	.391	.403	1 ½	6	1.304	1.269	1.307
9/16	12	.465	.453	.466	1 ⅝	5½	1.412	1.372	1.416
⅝	11	.518	.506	.520	1 ⅝	5	1.390	1.347	1.394
11/16	11	.581	.568	.583	1 ¾	5	1.515	1.472	1.519
¾	10	.632	.618	.634	1 ⅞	5	1.640	1.597	1.644
13/16	10	.695	.680	.697	1 ⅞	4½	1.614	1.566	1.619
⅞	9	.745	.728	.747	2	4½	1.739	1.691	1.744

DRILL SIZES FOR S. A. E. THREADS

Size of Tap	Size of Drill
¼ inch x 28 threads	7/32 inch
5/16 " x 24 "	17/64 "
⅜ " x 24 "	21/64 "
7/16 " x 20 "	⅜ "
½ " x 20 "	7/16 "
9/16 " x 18 "	½ "
⅝ " x 18 "	9/16 "
11/16 " x 16 "	39/64 "
¾ " x 16 "	43/64 "
⅞ " x 14 "	25/32 "
1 " x 14 "	29/32 "
1 ⅛ " x 12 "	1 1/64 "
1 ¼ " x 12 "	1 9/64 "
1 ⅜ " x 12 "	1 17/64 "
1 ½ " x 12 "	1 25/64 "

The above tap drills allow a thread within 1-64 in. of full thread.

Index to Tables and Data appears on Pages 41 to 44.

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WEIGHT IN POUNDS OF A LINEAR FOOT OF ROUND, SQUARE AND OCTAGON STEEL

Size in Inches	Round	Octagon	Square	Size in Inches	Round	Octagon	Square
1/16	.010	.011	.013	2 1/2	16.79	17.71	21.37
1/8	.042	.044	.053	2 5/8	18.51	19.52	23.56
3/16	.094	.099	.120	2 3/4	20.31	21.42	25.86
1/4	.168	.177	.214	2 7/8	22.20	23.41	28.27
5/16	.262	.277	.334	3	24.17	25.50	30.78
3/8	.378	.398	.491	3 1/8	26.23	27.66	33.40
7/16	.514	.542	.655	3 1/4	28.37	29.92	36.12
1/2	.671	.708	.855	3 3/8	30.59	32.27	38.95
9/16	.850	.896	1.082	3 1/2	32.90	34.70	41.89
5/8	1.049	1.107	1.336	3 5/8	35.29	37.23	44.94
11/16	1.270	1.339	1.616	3 3/4	37.77	39.84	48.09
3/4	1.511	1.594	1.924	3 7/8	40.33	42.54	51.35
13/16	1.773	1.870	2.258	4	42.97	45.33	54.72
7/8	2.056	2.169	2.618	4 1/4	48.51	51.17	61.77
15/16	2.361	2.490	3.006	4 1/2	54.39	57.37	69.25
.	2.686	2.833	3.420	4 3/4	60.60	63.92	77.16
1 1/8	3.399	3.585	4.328	5	67.15	70.83	85.50
1 1/4	4.197	4.427	5.344	5 1/4	74.03	78.08	94.26
1 3/8	5.078	5.356	6.466	5 1/2	81.25	85.70	103.45
1 1/2	6.044	6.374	7.695	5 3/4	88.80	93.67	113.07
1 5/8	7.093	7.481	9.031	6	96.69	101.99	123.12
1 3/4	8.226	8.674	10.474	7	131.61	138.82	167.58
1 7/8	9.443	9.960	12.023	8	171.90	181.32	218.88
2	10.744	11.332	13.680	9	217.57	229.48	277.02
2 1/8	12.129	12.793	15.443	10	268.60	283.31	342.00
2 1/4	13.598	14.343	17.314	11	325.01	342.80	413.82
2 3/8	15.151	15.981	19.291	12	386.79	407.97	492.48

AIR PRESSURES FOR INFLATING PNEUMATIC TIRES RECOMMENDED BY LEADING MAKERS

Diameter of Tire, Inches	Maximum Weight on Wheel, lbs.	Air Pressure in Tire lbs. per Square Inch
2 1/2	225	50
3	350	60
3 1/2	600	70
4	750	80
4 1/2	1,000	90
5	1,000	90

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ANTI-FREEZING MIXTURES

The percentage of alcohol, by volume, to give a certain freezing point can be obtained from the table below:

Freezing Point, Degrees Fahrenheit	DENATURED		WOOD	
	Alcohol, per Cent.	Water, per Cent.	Alcohol, per Cent.	Water, per Cent.
10	28	72	17	83
0	40	60	24	76
10	52	48	31	69
20	63	37	38	62

So little water is lost by evaporation that it is only necessary to add alcohol to the system, from time to time, to replace that which is used up.

The proportions of glycerine and water may be obtained from the table:

Freezing Point	Glycerine	Water
+28 degrees Fahrenheit	10 per cent.	90 per cent.
+15 degrees Fahrenheit	30 per cent.	70 per cent.
+ 5 degrees Fahrenheit	40 per cent.	50 per cent.
0 degrees Fahrenheit	48 per cent.	52 per cent.
− 5 degrees Fahrenheit	54 per cent.	46 per cent.
−10 degrees Fahrenheit	58 per cent.	42 per cent.

The difficulties in the way of using glycerine and water alone have led to the use of a mixture containing alcohol in addition. The alcohol and glycerine are generally added in equal parts to the water, the amount depending upon the freezing point desired. The percentage of mixture to add may be obtained from the accompanying table:

Freezing Point	Mixture Glycerine and Alcohol	Water
+20 degrees Fahrenheit	15 per cent.	85 per cent.
+15 degrees Fahrenheit	20 per cent.	80 per cent.
+10 degrees Fahrenheit	24 per cent.	76 per cent.
+ 5 degrees Fahrenheit	27 per cent.	73 per cent.
0 degrees Fahrenheit	29 per cent.	71 per cent.
− 5 degrees Fahrenheit	30 per cent.	70 per cent.
−15 degrees Fahrenheit	32 per cent.	68 per cent.

Calcium chloride in water is another solution that has been used with success. When purchasing calcium chloride it is very important to ask for the chemically pure salt as the commercial variety contains free acid which reacts on the metal parts of the cooling system. If it is impossible to obtain the former, the latter may be made fit for use by neutralizing the acid. To do this, add ammonia or soda ash gradually to the calcium chloride solution until blue litmus paper no longer turns pink when moistened with the solution. The amount of calcium chloride to use may be found from the table:

Pounds of Calcium Chloride per Gallon	Freezing Point, Degrees Fahrenheit
2	18.0 above zero
3	1.5 above zero
4	17.0 below zero
5	39.0 below zero

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NATIONAL AUTOMOBILE AND ALLIED ORGANIZATIONS

NATIONAL AUTOMOBILE CHAMBER OF COMMERCE, Inc.

7 East 42d St., New York, N. Y.

Objects: To foster the interests of those engaged in the trade or business of manufacturing automobiles and all other self-propelling vehicles.

To reform abuses relative thereto.

To secure freedom of its members from unjust or unlawful exactions.

To diffuse accurate and reliable information as to the standing of merchants and others dealing with members as to all inventions, patents, processes or devices designed or intended for use in, upon, or in connection with such vehicles and the manufacture thereof, as to the state of the art relative thereto, and as to the condition and development of the trade in which the members are engaged, in the United States and foreign countries.

To procure uniformity and certainty in the customs and usages of such trade.

To promote the construction of better highways.

To advocate the enactment of just and equitable laws affecting members.

To settle differences between members.

To promote a more enlarged and friendly intercourse among business men engaged in such trade or dealing with persons engaged therein.

To acquire by grant, gift, purchase, devise or bequest, to hold and to dispose of such property as the purposes of the corporation shall require, subject to such limitations as may be prescribed by law, including inventions, letters patent and processes, or rights thereunder, for the benefit of its members and not for pecuniary profit

Officers

President, Charles Clifton
Vice-President, Wilfred C. Leland
Secretary, R. D. Chapin
Treasurer, George Pope
Gen. Manager, Alfred Reeves

SOCIETY OF AUTOMOBILE ENGINEERS

29 W. 39th St., New York, N. Y.

Object: To promote the arts and sciences connected with engineering and mechanical construction o automobile vehicles.

Officers

President	Russell Huff
Vice-President	E. S. Foljambe
Second Vice-President	R. H. Combs
Treasurer	Herbert Chase
Secretary and General Manager	Coker F. Clarkson

AUTOMOBILE TRADE CREDIT ASSOCIATION

120 Broadway, New York, N. Y.

Object: To protect members against irresponsible debtors; collect and disseminate credit information

Officers

President, Carl Kaufman, New York, N. Y.
Secretary and Treasurer, Franz Neilson, 80 Wall St., New York, N. Y.

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MOTOR AND ACCESSORY MANUFACTURERS

33 West 42d St., New York, N. Y.

Objects: To promote in all lawful ways the interests of makers of motors, motor parts, and accessories.
To aid in the protection of its members.
To secure the advantages to be obtained by mutual co-operation.
To facilitate the collection of the claims of its members and the diffusion of information concerning trade dealers, credits, and other matters of interest to the members of the Association.
To co-operate with similar associations in other states.

Officers

President, F. Hallett Lovell, Jr.
First Vice-President, C. W. Stiger
Second Vice-President C. E. Thompson
Third Vice-President, T. J. Wetzel
Treasurer, L. M. Wainwright
Secretary and Asst. Treasurer A. P. Sloan, Jr.
Manager, W. M. Sweet

NATIONAL ELECTRIC LIGHT ASSOCIATION

(Electric Vehicle Section)

29 West 39th Street, New York, N. Y.

Object: The object of this Section shall be to promote the dissemination of knowledge in regard to, and the adoption and use of, electric vehicles for business and pleasure purposes.

Officers

Chairman, Walter H. Johnson
Vice-Chairman, E. S. Mansfield
Treasurer, H. M. Edwards
Secretary, A. Jackson Marshall

AMERICAN AUTOMOBILE ASSOCIATION

437 Fifth Ave., New York, N. Y.; Riggs Bldg., Washington, D. C.

Objects: To unite in one body all the automobile associations and individual motorists of the country; to secure reasonable and just legislation.
To aid in proper enforcement of automobile laws and ordinances; to advocate and obtain local, State and Federal aid in the construction and maintenance of good roads.
To encourage touring, and to secure, prepare, and disseminate information relative thereto; and
To support sportsmanlike contests and other movements that will advance motoring interests.

Officers

President, H. M. Rowe.
First Vice-President, Ralph W. Smith.
Second Vice-President, P. J. Walker.
Third Vice-President, H. J. Clark.
Fourth Vice-President, Preston Belvin.
Fifth Vice-President, David Jamieson.
Treasurer, H. A. Bonnell.
Secretary, John N. Brooks.

Chairmen of Boards:

A. G. Batchelder, Executive Board.
David G. Joyce, Touring Board.
Richard H. Lee, Legislative Board.
George C. Diehl, Good Roads Board.
Richard Kennerdell, Contest Board.

Index to Tables and Data appears on Pages 41 to 44.

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MACHINEBRONZE

12" Lengths — $1\frac{1}{2}$" to $4\frac{1}{2}$" Diameter, Inclusive, by $\frac{1}{8}$ths.

MACHINEBRONZE is made to formula established some years ago as standard for automobile construction and repair and recommended as the best general purpose bronze on the market .. Bars and bushings offered to customers are guaranteed uniform and as free from imperfections as the most rigid inspection and foundry practice will ensure.

CARRIED IN STOCK FOR YOUR CONVENIENCE BY THE FOLLOWING DEALERS

Beck & Gregg Hardware Company, ATLANTA, GA.
Chandler & Farquhar Company, BOSTON, MASS.
Root, Neal & Company . BUFFALO, N.Y.
Machinists Supply Company, CHICAGO, ILL.
E. A. Kinsey Company, CINCINNATI, O.
Cleveland Tool and Supply Company, CLEVELAND, O.
The T. B. Rayl Company, DETROIT, MICH.
Macan Jr. Company . . . EASTON, PA.
J. Russell Company . HOLYOKE, MASS.
Indianapolis Belting and Supply Company, INDIANAPOLIS, IND.
Frank Wheeler & Son, MERIDEN, CONN.
Badger-Packard Machinery Company, MILWAUKEE, WIS.
Manning, Maxwell & Moore, Inc., NEW YORK CITY
Maddock & Company, PHILADELPHIA, PA.
Brown & Zortman Machinery Company, PITTSBURGH, PA.
Belcher & Loomis Hardware Co., PROVIDENCE, R.I.
Smith-Courtney Company, RICHMOND, VA.
Strong & Hery Company, ROCHESTER, N.Y.
Robinson, Cary & Sands Company, ST. PAUL, MINN.

LUMEN BEARING COMPANY

BRASS FOUNDERS
BUFFALO

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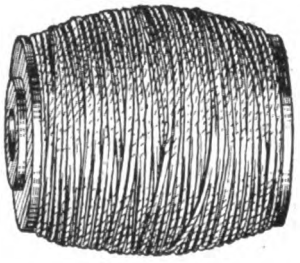
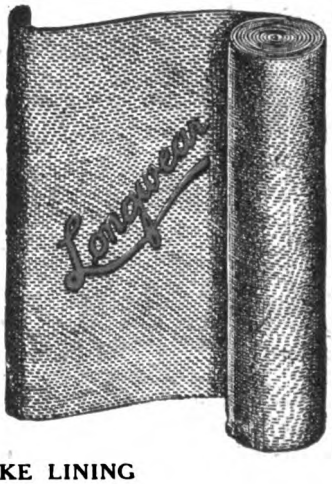


Longwear
TRADE MARK

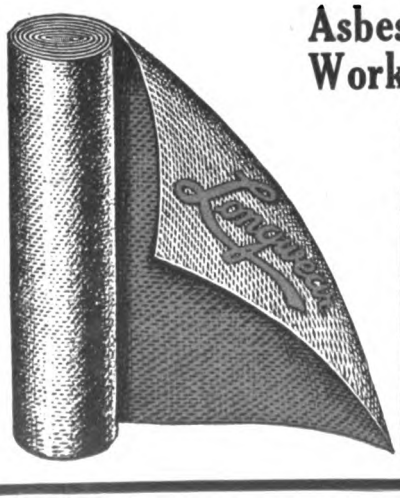


ASBESTOS AUTOMOBILE BRAKE LINING
CLUTCH FACING
FLANGE GASKETS
MANHOLE AND HANDHOLE GASKETS
PISTON AND SHEET PACKINGS
SPARK PLUG YARN

PRICE LIST—Per Foot

Thickness	WIDTHS 1"	1¼"	1½"	1¾"	2"	2¼"	2½"	2¾"	3"	3½"	4"
1/8"	.32	.36	.40	.46	.52	.58	.64	.69	.74	.83	.92
5/32"	.36	.42	.48	.56	.64	.72	.80	.87	.94	1.07	1.20
3/16"	.42	.50	.58	.68	.76	.84	.94	1.03	1.12	1.28	1.44
1/4"	.56	.66	.76	.88	1.00	1.12	1.24	1.35	1.46	1.67	1.88
5/16"	.75	.86	.98	1.14	1.28	1.42	1.58	1.72	1.86	2.11	2.36

PROOF AGAINST ACTION OF OIL, GREASE, WATER, MUD DUST



Asbestos and Rubber Works of New Jersey

General Office and Factory:
Camden, N. J.

Chicago Office: 1326 Michigan Avenue
San Francisco Office: 210 Sheldon Building

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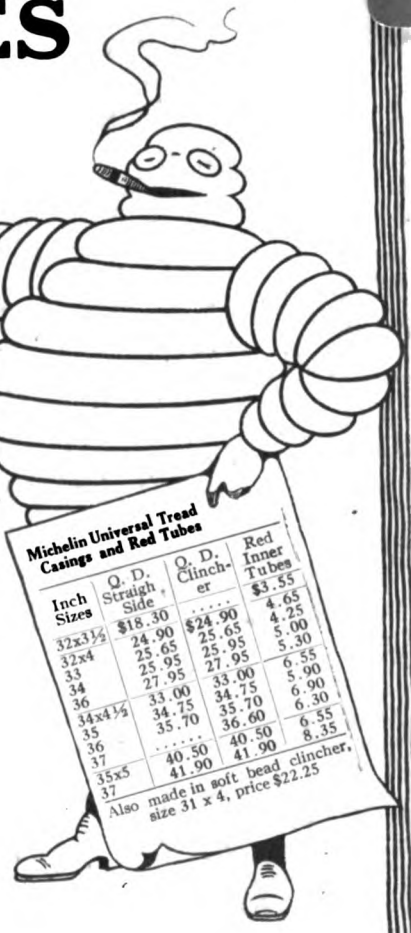
MICHELIN
TIRES

Michelin Universal Tread. Note the remarkable thickness of rubber and fabric.



Michelin Universal Tread Casings and Red Tubes

Inch Sizes	Q. D. Straight Side	Q. D. Clincher	Red Inner Tubes
32x3½	$18.30	.....	$3.55
32x4	24.90	$24.90	4.65
33	25.65	25.65	4.25
34	25.95	25.95	5.00
36	27.95	27.95	5.30
34x4½	33.00	33.00	6.55
35	34.75	34.75	5.90
36	35.70	35.70	6.90
37	.....	36.60	6.30
35x5	40.50	40.50	6.55
37	41.90	41.90	8.35

Also made in soft bead clincher, size 31 x 4, price $22.25

Low Price and High Quality—

backed up by big advertising give the Michelin dealer an advantage over all competitors.

Write for the Michelin Proposition

Compare Michelin Prices with those of other tires. Though unsurpassed in Quality at any price, Michelin Tires are almost as low-priced as the cheapest makes.

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BOCK

TRADE MARK

TAPER ROLLER BEARINGS

AN ALL-AMERICAN PRODUCT

THE DIAGRAM ILLUSTRATES THE BOCK PRINCIPLE.

The heads of the taper rollers are ground to form parts of perfect ball surfaces. These heads travel on their special race at points invariably in a direct line with the apex line or bearing surface of the taper roller. This exclusive feature makes the "Bock" free from the enormous sliding friction so destructive in other roller bearings, and solves the problem of successfully combining in one design the advantages of the taper roller and the ball thrust bearing. Bock bearings carry thrust loads equal to, or greater than the radial; and these loads may be applied either singly or in combination.

THE ONE BEARING sure to withstand the enormous thrust incident to the use of the worm drive or spiral bevel gears.

INTERCHANGEABLE with many sizes of other roller and ball bearings in general use.

THE BOCK BEARING CO. TOLEDO, OHIO

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BOCK

TRADE MARK

TAPER ROLLER BEARINGS

AN ALL-AMERICAN PRODUCT

THE DIAGRAM ILLUSTRATES THE BOCK PRINCIPLE.

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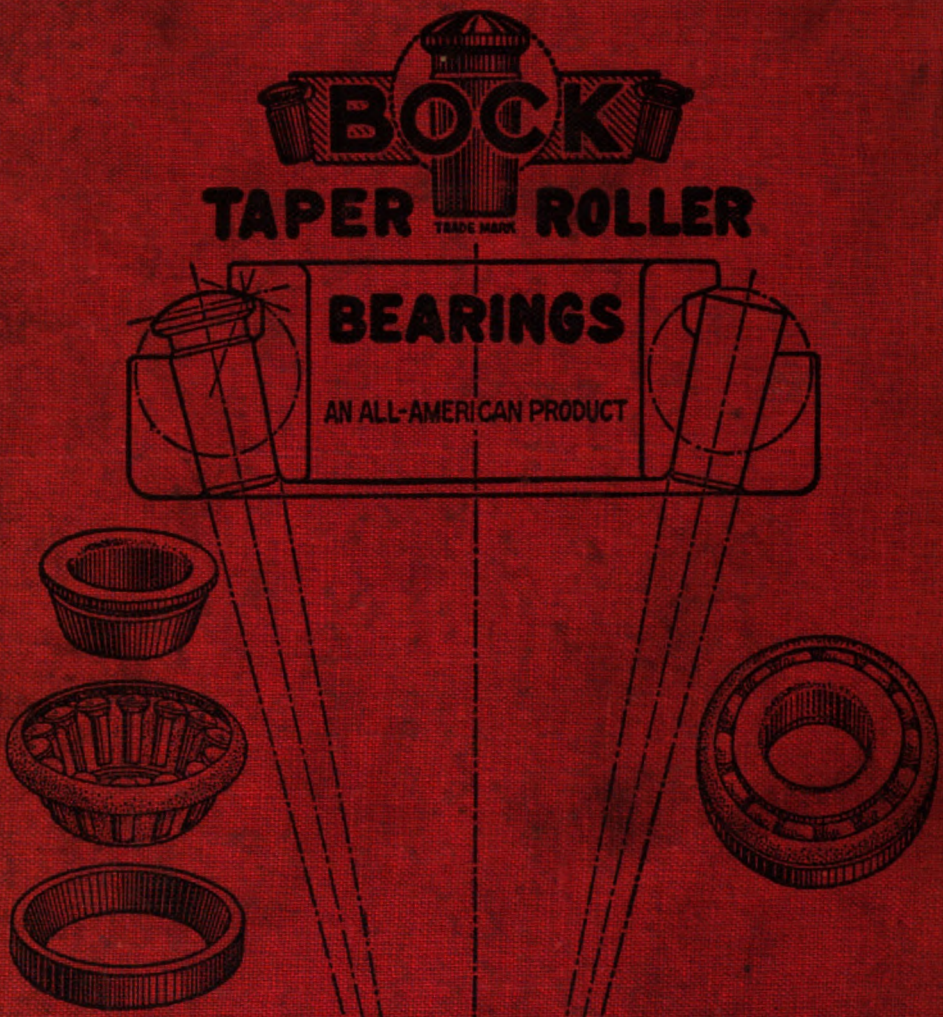

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